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F. J. S. GORGAS, A. M., M. D., D. D. S.,

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ARTICLE I.

Class Address.

Delivered by J. B. Ten Eyck, M. D., D. D. S., at the Thirty-third Annual Commencement of the Baltimore College of Dental Surgery.

Ladies and Gentlemen: It is with reluctance that I detain you longer after the very interesting and instructive address from our esteemed orator, whose words and eloquence are even now lingering with pleasing impressions upon your minds; yet, the members of the graduating class having conferred upon me the honor of representing them, I would ask your kind indulgence for a few moments.

In the weary hours of past labors, have we looked with fond expectations to this happy event, which will mark the "birth-day" on the dial-plate of our professional careers. This happy day with its pleasant associations will never be forgotten, but in the distant future, when the robes with which we to-day have been invested are well worn, we will look back upon it and feel a fresh heart-throb as the whole scene rises up illuminated by the "tender moonlight of memory."

While it is a duty incumbent upon me to pronounce the valedictory salutation to our honored professors and my fellow students, formally severing those familiar relations, which may be numbered among the pleasantest of our lives —to you, my dear friends, I would not breathe a word that could be construed into the language of parting; but, as a compensation for the ties this day severed, we desire to dedicate our lives and profession to your tender care, with a hope of deserving your highest confidence and liberal patronage.

Let us revert for a moment to that period when the beginning of a new era dawned upon the dental profession, the light of which has cast its genial rays far and wide, brightening up the dark corners and dreary wastes of ignorance. At this period which takes us back only about one-third of a century, a handful of men, kindled with a glow of earnest desire to rid our profession of its ignorance and sloth, conceived and founded the Baltimore College of Dental Surgery, the first and oldest institution of the kind that the world ever knew, and which stood for a while alone like a beacon light to the wayfarer. Cotemporary with the founding of this institution, was inaugurated the American Dental Convention, another bright additional light to aid in dispelling the gloom; its rays broke forth like those of the morning sun, causing the good seed to spring up, blossom, and bring forth fruit in good time. Soon followed the *American Journal of Dental Science*, another star of magnitude, which successfully reflected the light of science upon the profession. From these stepping stones, dentistry has rapidly taken rank among the learned professions, and is to-day, though youthful, the most vigorous of the fraternity.

One of the most evident signs of the advancement, worth and popularity of dentistry, is the appeal from the ladies to be taken into the arms of the profession. We heartily receive them, because we know their worth and fidelity; because prestige and honor are carried wherever they go; because we have a weakness towards humoring their wishes; and last but not least, because we love them.

The admission of women into the professional and literary world is an improvement worthy of the spirit and progress of the age. The experiment has proven that the evils involved, are not of such magnitude as many were wont to believe. In fact it has proven a decided success, much to the astonishment of many fathers of science, who have opened their eyes to find that woman's brain *can* comprehend something more than delicate sentiment, poetry and music; and this too without detracting from her feminine grace, or any of the charms of her sex. It is shown that she may become a consistent member of a profession without necessarily adopting Dr. Mary Walker costume, or becoming a corrupt politician. "Women's rights" in the offensive sense of the term, may not even be her ambition, and yet she may thirst for the knowledge of science, without *apparent* manifestations of an unbalanced mind.

The people are aware that while in dentistry there are many members of professional ability who deserve their respect and patronage, there are also many quacks and impostors, who are as leeches in society, sapping the life blood from its members, and the money from their pockets; who think of nothing beyond the dollars, and care nothing beyond self. It is important that the public should know who constitute the pretenders, and who constitute the regular learned profession. This can only be done by legislation. In most countries, the *law* lends its powerful aid to draw the line of demarkation, to protect the professions and the public from imposition and deception; but in this land of boasted liberty and equality, the most ignorant boor hangs out and flaunts to the breeze the badge of our profession—goes in with a bold and insinuating address, and plucks his victim under the cloak of the assumed title of doctor of dentistry. The odium of the mistakes, crimes, and failures of this class, is to a great extent visited upon the heads of the regular profession.

It is gratifying, however, to us and to the people, to know that the day and generation of quackery, this bane of our

profession and of society, is fast drawing to a close. It is unworthy of the age, and less consonant with the intelligence and progress of the world. Its foundation is built upon sand, and its frail structure is sure to crumble and fall to the ground. We already see a forshadowing of its fate in the initiative taken by several of the Southern and Western States in the enactment of stringent laws for the suppression of empiric and ignorant practice; this spirit of revolution and self protection is being caught by the people, and charlatans will be made to tremble.

The time is near at hand when the only respectable entrance to the profession will be through the regular collegiate course, and when the law and the people will demand of every dentist his credentials, as they do now of every physician.

Our dear friends, for the many manifestations of kindness you have shown us during the progress of our studies, for your presence here this evening, and for those beautiful floral tributes which speak volumes of good wishes in a language of eloquence and beauty, to you we tender our most grateful thanks.

Gentlemen of the Faculty, we meet you to-day for the last time, in the old and familiar relations of preceptor and student, which has existed so pleasantly during our collegiate course. To your kindness and sympathy are we indebted for the encouragement that has rendered our task less difficult to perform. To your diligent and excellent teaching do we largely owe that success and fruition which to-day gladdens our hearts, and fortifies our strength for future endeavors in the world's great field of enterprise.

Since the last annual commencement of this college, when happy faces, warm hearts, and the sweet incense of flowers filled this hall, one of the beloved members of our faculty (Prof. Bond) has been summoned to a brighter world. While we bow in humble submission to the will of an all-wise Providence, it becomes us to drop a tear to the memory of one who contributed so much to the good of the world,

and the progress of science. Although his spirit has returned to the God who gave it, his name will never die. His deeds and his influence survive him, teaching us who remain that the most enduring fame is that won by unremitting diligence, eminent christian examples, and a constant devotion to the advancement of a noble profession.

The revered and honored names of Hayden, Harris, Baxley and Bond, will ever shine in the starry firmament of science, brightly illuminating the pathway of the professional pilgrim. They need no pyramid or monument to perpetuate their memory, "A good deed can never die." It is a possession for all time, caught up by rejoicing angels; it is "syllabeled on tongues of air, by rocks and woods and lonely mountain sides. Gentlemen, a shadow crosses our thoughts when we realize that these are our parting words. The friendly interest you have manifested *to us* during the whole period of our associations has *deeply impressed us*, and we part from you with the same feelings of regard and affection, as we do from our dearest friends. Accept then, gentlemen of the faculty, as we bid you farewell, the warmest assurance of our grateful remembrance.

Fellow Students, we have met here to-day to realize our cherished hopes, to receive from our *alma mater* the reward of long and arduous labors. To-day is placed in our hands a passport, which admits us into the ranks of a profession that is honorable and useful, and which may acquire for us the respect, esteem and gratitude of the community in which we live—a passport to that royal road which has been successfully traveled by many who have walked faithfully in its paths before us, and who are glorified in its compensating gratifications and substantial rewards. Our hearts are light, our step is buoyant, our resolutions strong, and of course *we* expect to reach those resting places ; but have we counted the cost? Do we know how weary and footsore we shall become, and how tempting it will be for us to sit down by the wayside before we have reached the prize, which "seemed so near and yet so far?" Do we realize that we have chosen

a profession whose march is so rapid that the most resolute and active feel somewhat breathless in trying to keep up with its progress? and yet, our vocation is only consonant with the spirit of the age in which we live. In this day and land of ours, to use the forcible metaphor of Carlisle, "the race of life has become intense; the runners tread upon each other's heels; woe to him who stops to tie his shoe strings." When we consider the emotional excitement, the greedy competition, the ceaseless work which characterizes every profession and every calling in this age of wonder and progress, who of *us* but must be spurred on to keep up with the advance guard of the grand army in its warfarea gainst ignorance, false theories, and undeveloped science, resolved to add something to the common fund by hard study and close observation.

Never before in the history of the world have there been so many avenues opened, and so many facilities for obtaining knowledge in all the various branches of science as to-day. Shall we improve them? Who from among us are to be the heroes of our generation—the great men of the future? We all have within ourselves the magnificent possibilities of life: let us use the talents God has given us, and not "hide them in a napkin."

The imperative to labor is upon us all; but this doom carries a covert blessing under its apparent shadow. Our lives are intended to be active, fruitful, and influential. Let us have a heart to do, and a *will* to accomplish, and we have a power to break through obstacles of habit, time, place or circumstances. What the power of the sun is in the physical universe, is the power of the *will* in our intellectual and moral natures. As without the sun there can be no seed-time and harvest, no seasons, no flowers no beauty in nature to make our hearts glad, so without the *will* there can be no noble actions, no advancement in science, no honor or renown. It was this power of will which served the ambition of Cæsar, Napoleon, and Alexander the great, and carried Harvey, and Jenner, and Kelper, through years of toil and research ere they triumphed.

There is an idea likely to insinuate itself on the minds of men generally, where strength of will and pluck is wanting, that luck in some mysterious way will lead to fame and fortune. Such are idle dreams, which intoxicate the senses and ruin our prospects for life. Luck is said to be an *ignis fatuus* that may lead us to ruin, but not to success. Let us not wait, Micawber like, for something to turn up—things do not turn up in this world unless somebody or something applies the power. Inertia is one of the indispensable laws of matter, and things lie flat where they are, until by some tangible force they are put in motion.

Let us ponder deeply over the life-struggle that is before us, and the nature and extent of all the duties which a faithful response to the claims of the profession demands. Let us remember that as votaries of a liberal profession, the obligations are imperative, to cultivate assiduously its science, and to keep pace with its rapid strides.

Gentlemen, that we may glide safely through the storms of life, and preserve a cheerful and blissful composure under its vicissitudes, let us at all times entertain an abiding sense of the providence, presence, and goodness of the great Jehovah. We see his loving kindness evinced in manifold ways; in the language of on eloquent author, "The love of God smiles in the beauty and verdure of spring, and flows brightly in the ripling waters; it sings in the simple and touching melodies of nature, and warbles and rejoices in the shouts of harvest."

Gentlemen of the graduating class, farewell.

ARTICLE II.

The Brunonian or Molecular Movement.

By James Tyson, M. D. October No. *Dental Times*, 1872.

REVIEWED BY S. P. CUTLER, M. D., D. D. S., MEMPHIS, TENN.

It seems to me that the above named writer, somewhat misunderstands or misconstrues the sum and substance of my paper in his criticism; that is, if I understand him right.

It is true, I somewhat followed the text of other authors, as quoted in my paper, (and many others not quoted for want of room,) which were consulted at the time, but finding no settled *dictum* on the subject, I simply gave the result of my researches and opinions, written independent of all others.

The above writer can not accuse me of plagiarism, although he may suppose that all I said and described, and ideas advanced, were generally understood by any and all microscopists of any pretensions. But if he will carefully examine my second paper, read on the fifteenth of April, 1872, at the Academy of Sciences, at New Orleans, just one week after the first one was read, and published in the October No. of the *Nashville Medical Journal*, he will see other authors quoted, and the result of further microscopic observations and opinions, somewhat different from those contained in my first paper, read at the same place one week previous, and published in the science column of the *New Orleans Picayune*, and subsequently published in the June No. of the above named journal.

In this second paper (containing the result of an immense number of microscopic observations, of every conceivable substance to be had in the city and elsewhere,) ideas are advanced, that these vibratorial atoms or molecules described, are nothing more or less than the ultimate atoms of matter, with, to myself, good and substantial reason for so thinking, notwithstanding the published opinions of Huxley, Tyndal, Sir Wm. Thompson, and others, that the ultimate atoms of all matter are so small, that they never can be reached.

In this second paper I gave my reasons why these and all other authors on the subject had failed to find them; *i. e.*, they all were hunting for something too small, and used powers too high to see them, which are easily found in everything, by following my plan as given in these papers. I again repeat here, that if any competent microscopist thinks enough about it to follow out my plan as given, he will be certain to see what I have described, and as I saw them,

whether he thinks with me or not, that will be a matter of opinion, while the facts are more fully recognized. I also assumed that there is no such thing as dead matter, *so-called*, and that all matter in its atomic form, or condition, possesses life attributes when seen floating in liquids, *i. e.*, motion, life being but a mode of motion, the result of organism, *i. e.*, animal life.

It will be seen by a careful perusal of my first paper, in closing, that I did not regard these forms as organic at all, instead were the component of all kinds of matter, both organic and inorganic. The writer in the *Times* journal, would have us believe, that these minute objects were well understood and recognized by all investigators in microscopy, as though their true place in nature were well understood and recognized. On the contrary, they are imperfectly understood by all investigators up to the present time; which will be readily seen by perusal of the labors of the following investigators, under various heads, besides others not mentioned.

Clifford, Darwin, Helmholtz, Doner, Pouchet, Dr. Grenhow, Beale, Glugey, Cagniard de la Tour, Pflume, Tyndall, Ure, Smith, Sir H. Holland, De Saussuire, Dr. Stanhouse, Beauchamp, Virchow, Leidy, Chatman, Kircher, Pasteur, Nyander, Henle, De la Rive, Schleiden, Bruche, Carpenter, Hillyard, Winlow, Banson, Schwan, Gay Lussac, Reaumer, Eisalt, Dr. Budd, Humboldt, Liebig, Henfrey, Ehrenbergh, Dancer, Cavier.

I find no definite or settled conclusions of their true place in nature, and only passing notices taken of them, and not regarded even as of much importance in the catagory of microscopic science.

Writer says, "So early as 1827, Dr. Robert Brown of Edinburgh, announced, that it was by no means confined to the favilla (speaking of pallin grains,) but was possessed by numerous other substances, organic and inorganic, and therefore in no way characteristic of life." Writer further says, Indeed all substances, when minutely divided, exhibit it."

Did the above writer first publish the above statements as they are substantially stated in my paper referred to? He further says, in the same sentence, "although the different substances which are light, as particles of indigo, or gumboge, requiring to be less minutely divided than those which are specifically heavy, as iron or other metal." This latter statement is substantially an error; showing conclusively to my mind, the want of a proper knowledge of the subject he pretends to be so familiar with. The statement is wholly unfounded in fact; let any one thoroughly versed in microscopic knowledge, follow out my directions given in the paper (so rudely criticized by the writer,) and let him apply the micromitic, and accurately measure the diameters of all the substances given in my paper, and he will find that there is really no practical difference in the average sizes of each substance, the range of sizes being just about the same. In this statement, I challenge all opposition to the contrary, including my opponent in this challenge; none to be so harshly criticised by any one clearly so unfamiliar with the subject, excites pity rather than contempt.

Further on, the writer says, "In almost all instances, however, the degree of division is so small as to acquire a power of at least 200 diameters, and in the case of heavier substances, combination necessary is so great, that 400 or 500 diameters may be required to exhibit it."

In these statements the writer has given the powers as given in my paper, for what he calls the heavier substances, without any quotation marks; he may have already given them in some former passage; if so, I stand convicted, as I had not seen the same; if he gets them from any other writer, he has not given the proper acknowledgements. I wait for information. In his speaking of different powers to see the atoms, I will award to him the credit, as I gave no such distinctions; so far as my observations are concerned, the same power answers equally well for all bodies, there being no recognizable difference, as I have already stated above. From those signal mistakes, or errors on the writer's part,

I am satisfied of his want of accurate knowledge on the subject. Any one who will take the trouble to examine the paper of mine referred to, will towards the end, or latter part, see that I did not regard these the smallest of all objects as organic, but to the contrary, as belonging to all bodies; in this respect the writer has done me injustice, and misrepresented my position.

The directions the writer gives for preparing specimens are substantially those to be found in my paper, he failing to put any quotation marks.

The writer's statement, that these atoms have but the molecular motion and do not change place, is simply a mistake, and any one familiar with their motions will readily discover it, as they do move about more or less, but when in dense masses, of necessity, their movements in this respect are embarrassed to a certain extent. The solitary motion as described by Hillyard, referred to in my paper, is also easily recognized.

I claim that I have found the same phenomenon in everything examined, and that my examinations have been more extended in this direction than any one else's, to my knowledge; I claimed that those same little forms composed the terminus—a broad statement truly, and in my subsequent paper I claimed for them the finality or ultimate of matter, *i. e., ultimate atoms or molecules.*

The writer in the *Times* journal speaks in strong terms, as though he thought I had committed a most signal blunder. The writer calls this motion the Brunonian motion, in honor I suppose of Dr. Robert Brown, of Edinburgh, though none of the above writers named, I believe, mention the fact; if so, it has slipped my memory. Dr. Beale describes the oscillary motion very well in some respects, but does not describe the other motions at all. Dr. T. C. Hillyard recognizes two motions only.

ARTICLE III.

Predisposing Causes of Dental Caries.

BY JEROME B. TEN EYCK, M. D., D. D. S.

In discussing the subject of dental caries, our remarks will be confined principally to those predisposing causes dependent upon *defective nutrition.*

Investigations have proven to us that the teeth of past generations have not been found to be attacked with caries to so great an extent, by far, as those in modern times; and that in countries the most advanced in civilization, there do we find that dental caries prevail to the greatest extent.

That there are many causes predisposing to dental caries, in connection with, and independent of defective nutrition, is beyond peradventure. We observe in that peculiar constitutional habit of the body called *diathesis*, which is entailed from one generation to another, the causes of various pathological conditions manifested in the entire human organism, but nowhere more distinctly marked than in the dental structures. In the temperaments which are characterized by various constitutional tendencies, and which are amenable to laws of nature that are fixed and certain, do we find the physical character, and pathological condition of the dental organs in different types.

Some medicines have been proven to have various deleterious tendencies upon the constitution, and directly or indirectly to influence the vitality of the teeth. Infectious diseases, as well as epidemic and others, sow some of the seeds of premature decay. The effects of impure air, such as poisonous exhalations from swamps, and decomposing filth from cities, are among the causes of defective development.

The predisposing causes above referred to, with many others, which we omit to mention, operate to a greater or less extent in every country, even where dental decay is rarely seen. It is evident, therefore, that there is some cause inci-

dent to the mode of life of the people in civilized countries, paramount to the above mentioned causes, which exercises a deleterious and destructive influence upon the dental organs.

The science of physiology teaches us, that the formative material which developes bone, muscles, tissues, and every part of the human organism, is produced from the blood; and that the blood is formed from the food ingested and assimilated in the system. It is evident that the blood to be pure and good, must require *pabulum* containing all the necessary ingredients to form the different tissues of the body, or imperfect development must inevitably ensue.

Civilization with its artificial methods of preparing, destroying, and depriving food of its proper nutritive elements, is responsible to a great extent for the lack of development so alarmingly manifested in the early decay of teeth. Chemistry teaches us that *lime salts* not only constitute the principal part of the bony structure, but that they enter into the composition of every other tissue of the body. The daily quantity which is necessary to maintain the body in health, bring for the bony tissues, about one per cent. of their weight, exclusive of what is necessary for other tissues of the body. This would seem a large proportion of the mineral elements required for the *removal* of waste material of osseous tissue; but much more is required, we may reasonably infer, to daily *build* the tissues during the period of growth.

The greatest mischief ensues to the dental organs when the mineral elements are denied to the embryo and infant, for it is during these periods that the teeth are developed and formed, which, if defective, nature can never restore; consequently if the mother does not replenish her blood with the required constituents, the teeth of the child must inevitably and irretrievably suffer. It is a well known fact that women, particularly f our civilized country, make fine flour of wheat the principal portion of their subsistence, and the same remark applies to children for the first seven or eight years of their lives; the consequence, as regards the teeth,

is that their tissues are starved, the dental tubules are not normally calcified, neither is the enamel hardened with the flinty quality which it ought to have, excepting perhaps on its surface, which is superficial and does not extend the whole length of the enamel columns. The dental surgeons find these cutting easily with their excavators and chisels. The lines on the enamel of these teeth making the boundaries of the different circles of calcification are deep, extending to the dentine in many instances, and affording a lodgement for particles of food or other extraneous substances capable of fermentation and forming acids, which together with the acid secretions of the mouth when morbid, dissolve the lime salts from the dental tissues. The vital process having been interfered with in its microscopical structure, the cells are broken down by a low grade of inflammation, and the cavity of decay grows larger day by day.

If the mother does not ingest sufficient mineral substance in her food to nourish and build up the bones and teeth of her child, whether "in utero" or at the breast, a portion of her own supplies will be extracted from her osseous tissues for this purpose; and here may be assigned one of the principal reasons why mothers suffer so much from dental decay and tooth-ache.

That salts are furnished the child which are abstracted from the mother's tissues, is said to be proven by the greatly diminished amount of effete salts excreted by a nursing mother who is not receiving ingesta in sufficient quantity. Effete lime salts are daily cast out of the body, chiefly in the urine, by those even undergoing the process of starvation. The retention of them would seem to be demanded if consistent with physiological harmony, but nothing short of the demands of a new being *seems* to command their retention or conversion into vitalized factor of nutrition.

Although most of the articles of food, fruits vegetables, meats, &c., are deprived of their mineral elements by processes of cooking, *that* article acknowledged in all countries to be the staff of life, and which should be kept inviolate

from the mischievous devices of man, is the one of all others the most completely robbed of its important nutritive properties.

The white and glistening starch cells constitute the principal bulk of *fine* flour of all grains, and these cells are very poor in phosphates. The gluten cells are the great magazines of the phosphate of lime; the gluten cells are dark colored, and in wheat lie in a single layer directly beneath the bran coat. To the bran they mostly adhere when wheat is ground for *white flour*. Prof. Hosford of Cambridge, in his pamphlet on "bread making," shows some cuts of gluten cells adhering to commercial bran, as seen under the microscope. The experiments of Johnston, of England, and Mayer of Germany, have found *fifteen times* more of the phosphates in *unbolted wheat*, than in superfine flour, proving that the bolting process abstracts almost entirely the elements demanded for the nutrition of the osseous tissues.

The Creator in his wisdom has provided all the necessary elements of nutrition in suitable proportions in every kind of food which would seem to be natural to man, in whatever clime he may choose for his habitation. As the phosphates of lime are so imperatively demanded by all living creatures, so also are they found in abundance in every kind of food in its natural condition, whether corals, legumens, roots, or the flesh of animals.

As the dental organs of the present generation are inferior in durability to those of the preceding one, so if the same causes continue to exist, added to those acquired by inheritance, the injury *must* increase with each succeeding generation, until we at last, reasoning from analogy, become a toothless people.

The duty of the dental and medical professions do not end with the cure or repair of disease; it is a higher and more imperative one to prevent it; the people should be instructed in the laws of health, and those mighty evils which are being perpetuated and increased, should be proclaimed all over the land, until the people are made to see the alarming evils of their ways.

American Dental Association.

The Committee on Literature of the American Dental Association, would request members of the profession to inform them of any new works which have appeared, or may appear before the next annual meeting of the Association, in order that no work which should properly be considered by the committee, need be overlooked by them.

George H. Cushing, Chairman,
550 Michigan Av., Chicago.
E. A. Bogue, 29 East 20th Street, New York City.
C. N. Pierce, Philadelphia.

California State Dental Association.

The California State Dental Association will commence its fourth annual session in San Francisco, Tuesday, May 20th, 1873, at 10 o'clock A. M., and holding four days. Every member of the profession on the Pacific coast is cordially invited to be present. Clinics daily.

H. J. Plomteaux, *Rec. Sec.*

Southern Dental Association.

The fifth annual meeting of this Association will be held in Baltimore, commencing on the last Tuesday in July next.

Jas. F. Thompson, M. D., D. D. S.

SELECTED ARTICLES.

ARTICLE IV.

Irregularity.

BY ISAIAH FORBES, D. D. S.

Writing upon the subject of the causes that produce irregularity, if one coincides with the generally expressed opinions of the day, would be a waste of time, and the result an unprofitable paper, for the subject seems to be completely exhausted. But when the subject is to be considered in a different light from that in which our early education has taught us, a new field is open for our consideration, reflection and investigation. I will therefore confine myself to that branch of the subject which we are educated to regard as the principal cause of irregularity of the dental arch, viz.: the premature extraction of the deciduous teeth—and while expressing my well known convictions on this subject, I cannot but feel that my position is an unenviable one. There is nothing so difficult to change as the impressions and prejudices of our early education. The more I have studied and reflected on this branch of the subject, the more have I become satisfied that the doctrine, as taught in our dental text books, cannot be correct. Several years have passed since I first expressed my convictions on this subject in our local societies, and the most *forcible* argument that was then advanced in opposition was: "Is that the way you do in your practice?"

Some two years after this period, while opposing a paper on the subject of irregularity, I had the proud satisfaction of learning that Mr. Tomes in his histological investigations

had come to the same conclusion. In his "System of Dental Surgery" he says—"It has been usual to assume that the premature extraction of the temporary teeth occasions a contraction of the jaw, but I do not think that any anatomical facts can be brought forward in support of the supposition. If a temporary tooth be removed, the crowns of the contiguous teeth may lean toward each other and give the appearance of contraction, but it does not really involve a diminished size of that part of the jaw from which the tooth has been lost."

Again: (page 188.) "If specimens be examined in which the two sets of teeth are present, it will be seen that the implantation of the temporary teeth occupies but a very small space in the alveolar ridge, as compared with that occupied by the crowns of the permanent teeth. Organs in an active state of development induce the expansion of the parts about them, and there is no good reason for supposing that the jaw forms an exception to this rule. The persistence of the first, which are placed immediately in front of the second, still may, and frequently does interfere with the outer progress of the latter; but I cannot see how the removal of the temporary can produce a prejudicial influence upon the arrangement of the permanent teeth." "In the case from which the accompanying illustration is taken, the two central incisors were lost long before their successors were ready for eruption, hence the sockets became obliterated, and the alveolar ridge made good; but we do not see the slightest trace of contraction of the jaw." This case presents so strong a similarity to one in my own family that I present it as another proof of the position I have taken. No matter how much deference a dentist may pay to the prejudices of early education in his general practice, he is at liberty to exercise his own judgment or convictions in his own family, without the fear of compromising the dignity of his profession among his brethren. My elder children *played* dentistry on my youngest by using Excavators, and kept at it until, subsequently, the incisors became painful, before I was

aware of what had taken place; and the young rascal was so stubborn that he would not even permit his mother to make an application for his relief, when she concluded, for the comfort of the child, that the teeth had better be extracted. As soon as I was made acquainted with the facts, out the teeth came before I let go of his head, both centrals and one lateral; now, *his jaw* and the permanent teeth are as well developed as if the temporary teeth had been allowed to remain until the roots had become completely absorbed. Prof. Gross tersely says, "There is generally a great prejudice, even on the part of dentists, against the extraction of the deciduous teeth, on the supposition that it has a tendency to interfere with the development of the permanent set. I have been at much pains to inquire into the matter, and am satisfied that the idea is altogether erroneous. On the contrary, the operation, so far from being injurious, will generally be found to be eminently beneficial, not only relieving pain, but conducing to the beauty and perfection of the future organs." Thus briefly does he dismiss the subject, clearly intimating that he who becomes thoroughly acquainted with anatomy, the development of the jaws and the teeth, must be convinced that the theory held by many, and taught in our text books, must be incorrect.

One of the great causes of irregularity is the retention of the temporary teeth beyond the proper period for their shedding; the lateral pressure of the permanent incisors and the bicuspid against the temporary canine has retained that tooth beyond its proper period, and diminished the prospect for the development of the canine, and in some cases entirely obliterated the membranes that furnish the ossific material for the development of the tooth. The jaw grows and expands by interstitial lamellæ, the same as the softer tissues. Common sense *indicates* it. Anatomy and physiology proclaim it. Histology and microscopy confirm it. Let us be ready to investigate the errors of our previous education and acknowledge the truth as made manifest by the researches of the ardent student. We are living in too en-

lightened an age to declare or sustain the characters of the persecutors of a Harvey.

The more a student studies osteology, and the better he becomes familiarized with the structure and growth of bones, the more will he become convinced that the premature extraction of the deciduous teeth cannot possibly cause any contraction of, or diminish *in any sense the growth* of the *jaw*. Different arteries, or branches of the same artery supply the teeth, the alveolus, and the jaw. While doing so neither is dependent on the other for nourishment. The alveolus is formed during the growth of the roots of the teeth, yet not dependent on the blood vessels of the teeth for nourishment, and when the deciduous teeth are extracted, the blood vessels supplying the jaw are not in any manner contracted, nor the ossific material they may have contained diminished. The facial artery supplies the jaw, the alveolus and the teeth; the alveola grows with the growth of the tooth, the growth of the alveolus becoming necessary for the support of the tooth. Extract the tooth, its *support* not being wanted in the animal economy is dissolved away, neither of which, when lost to the mouth, can effect a contraction of the arteries that ramify through the jaw and supply it with ossific material. When a tooth is extracted it is simply, as it were, clipping off the end of an artery that supplied the tooth, and not the artery that supplies the jaw, and if any change *is effected*, science must decide that the *retention* of the temporary tooth would have the tendency to contract the jaw, for the blood that flows to nourish the teeth and process would then be free to nourish and develop the jaw; nor can I see how mastication of the food by the temporary teeth can *increase* the flow of the blood to the jaw, or the want of the *means* of *mastication diminish* the flow of the blood to the jaw, except in so far as want of proper mastication of the food may lengthen the time for chymification, and consequently, less chyle becomes assimilated with the blood for the time being, and then one portion of the system suffers no more than another. Again, it is claimed

that the food should be well masticated to obtain a plentiful supply of saliva to mingle with the food, *to assist as a solvent.* Its importance in that particular is very questionable. The saliva is required simply for a lubricator, water answering the same purpose. It is certain that the saliva dissolves starch and sugar, but even these articles, when taken in the mouth, are not usually dissolved before deglutition takes place, and the more active dissolvent properties of the gastric juice does not require its assistance; in fact it has been proven by experiment, "that the mixture of the saliva with the gastric juice rather retarded its solvent action. I do not wish to deny the utility of the saliva; it is certainly important as a preliminary to digestion; its legitimate and only use is to lubricate the food, and to facilitate the passage of the bolus through the organs of deglutition. Water will answer the purpose nearly as well as saliva, though the mucous properties of this secretion may give it a slight preference."

Mr. Garretson, in his work on "Oral Surgery," speaking of crowded dentures, from the want of space in the arch, says: "This anomaly has, perhaps, the largest associative pathological condition. I remarked that this lesion, if we may term it such, is more frequently the fault of the surgeon than of nature. If, for one moment, we refer to certain physiological relations existing between the first and second dentures, we may find that it is within our power to prevent the many ills that follow so frequently in his train, and simply by doing little, or, more commonly, nothing. The deciduous arch, as we are all aware, is filled completely by its ten teeth. The second or permanent set is to comprise in number sixteen, and each tooth certainly quite as large as its predecessor. This increase in number and size of the teeth, it is evident, must be provided for in an enlargement of the alveolar arch. This provision is always attempted by nature in the process described by the physiologist as the elongatory. I will illustrate this process of maxillary enlargement by considering the ten milk teeth as so many

wedges placed in a *springy* arch. This arch it is designed to lengthen by additions to either end. If, now, these wedges should be removed before others were ready to take their places, it is evident that the elongation being made at the ends, would, to a greater or less extent, be counterbalanced by the springing together of the parts at the sites of the removed wedges. The process of maxillary, or rather alveolar absorption is truly represented by this retraction of an arch. In proportion to the number of the deciduous teeth removed prematurely will be the curtailment in size of that arch, at least of its alveolar face.

"Prof. Gross and Mr. Tomes, also, in his last book, denied this position; why, I know not. With the greatest possible respect for the opinion of these gentlemen, it is my experience that they are wrong.

"If there is a pathological Pandora's box, it is certainly the lesion of an overcrowded maxillary arch. Such condition is made evident to the practitioner the moment he looks into the mouth of the patient; the teeth are jammed into the most uncomfortable looking positions; the deformity, however, mostly existing in the front of the mouth—either the central incisors override, or the laterals are thrown back, or otherwise the cuspidati take the tusk position, standing out prominently from the arch, the bicuspids occupying too anterior a location, approximating, indeed, not unfrequently with the lateral incisors."

Mr. Garretson says: "If we refer to certain physiological relations existing between the first and second dentures, we may prevent the many ills that follow so frequently in this train, and simply by doing little, or, more commonly nothing;" and yet he does not inform us what those physiological relations are, but simply gives us what he calls an illustration of the process of maxillary enlargement, which is described by "Physiologists as an elongatory; he considers the ten milk teeth as "so many wedges in a *springy* arch. This arch it is designed to lengthen by additions at either end," meaning to lengthen from the second deciduous molar to

the ramus of the jaw. "If, now, these *wedges* should be removed before others were ready to take their place"—is it evident that the elongation being made at the ends would, to a greater or less extent, be counterbalanced by the springing together of the parts at the sites of the removed wedges, supposing one or more of the deciduous teeth had been prematurely extracted. After studying Wilson and Grey I cannot conceive how the premature extraction of the deciduous incisors could prevent the elongatory development of the jaw from the second deciduous molar to the ramus. Nor can I conceive how the *elongatory* enlargement of the jaw can make room for the *six front permanent teeth*, when they are "nearly as broad again" as the deciduous teeth, and if this "process of maxillary, or rather, alveolar absorption is *truly* represented by this retraction of an arch," I cannot conceive how 'tis possible to avoid irregularity of the front teeth.

We know that the first permanent or sixth year molars stand farther apart at the age of twenty than they did when first erupted, and they stand as perpendicular in the jaw. We know that the labial surface of the crowns of the six front teeth stand almost as perpendicularly in the adult as the deciduous teeth in the child; therefore the "elongatory process of enlargement" above, and the retention of the "deciduous wedges in the springy arch," would not, could not possibly increase the span of the arch "half as much again," so as to enlarge the space necessary to permit the teeth to attain a perfectly regular position. We know the six front *permanent* teeth are certainly quite as large again as their deciduous predecessors. We *know* the bicuspids are no larger than the deciduous molars. We *know* that in the incipient stages of development the permanent teeth lay, as it were, folded upon each other or lapping one another. We *know* that if the arch of the jaw did not enlarge, that the permanent teeth must erupt, and continue in an irregular position. We *know* that the base of the arch of a child's jaw is not as broad as a man's. We *know* that the child's

tongue holds the same relation, as regards size, to the child's jaw as the man's tongue does to the man's jaw. We know that the man's tongue is much broader than the child's, therefore, the base of the arch of the man's jaw must be broader than the child's. We *know* that the *arch* of an adult jaw extends to the distal surface of the canines, from thence backward the jaw is nearly a straight line. We *know* that arterial branches, totally distinct and independent of each other, supply the jaws, the alveolns and the teeth. We *know* that the extraction of a temporary tooth, or the absorption of the temporary alveolus does not diminish the size of the Haversian canals through which the blood vessels flow that supply the permanent teeth and alveolus. We *know* that the Haversian canals, which are channeled out of this compact substance, convey the blood vessels for its nutrition. Therefore I cannot conceive how it is possible that the removal of one or more of "the wedges that compose the springy arch" would cause a "springing together of the parts at the sites of the removed wedges." On the contrary I can conceive how an *undue retention* of the deciduous teeth, and a firm alveolus on the labial surface of the jaw, might cause a "pathological pandora's box."

If my statements are anatomical and physiological truths, and cannot be controverted, let us be ready and willing to acknowledge, *a la* Harvey, that the blood *does* flow through the system, and reverse our advice to mothers when their little children are presented to us for relief, with badly decayed, aching teeth. Extract the teeth, thereby giving the child permanent relief, and say to the mothers—what appears to me to be the honest truth—"the extraction of the teeth cannot possibly do any harm, but on the contrary, even though by an application we could alleviate the pain, their retension might injure the healthy growth of the permanent teeth."—*Missouri Dental Journal.*

ARTICLE V.

Adhesion of the Soft Palate and Uvula to the Posterior Wall of the Pharynx—Operation—Cure.

BY A. B. COOK, M. D.

The subject of the following case, F——, J——, woman of color, low, heavy set, with short and thick neck, 27 years of age, married, the mother of two children, the youngest now 12 years old and healthy, some years ago contracted syphilis, at what time cannot now be ascertained. Previous to the spring of 1870 she was a stout, healthy woman. About that time her throat became ulcerated, which was the first evidence of secondary syphilis; the ulceration involved, so far as I can learn, the tonsils, soft palate, and upper portion of the pharynx, accompanied with tumefaction and elongation of the uvula. She stated that from the spring of 1870 until last June she was almost constantly under medical treatment, which embraced a great variety of internal medication, with the local application of caustics, gargles, probanging, and inhalations, despite all which the disease persisted and produced the following local structural changes, lesions, and symptoms which presented when I was first called to see her in May, 1872.

The soft palate was firmly adherent to the pharynx, excepting a diminutive opening in the left side of the median line, scarcely large enough to admit the passage of an ordinary sized probe.

The uvula was broad, flat, enlarged, and elongated, the apex reaching a point corresponding to the inlet of the larynx; it was inclined a little to the right of the median line, and was completely attached to the posterior wall of the pharynx, the right posterior palatine arch, and the posterior part of the right tonsil. She complained of great soreness on the floor of the posterior nares, saying it felt like a raw place, due, no doubt, to a superficial ulcer. The pharynx and tonsils presented several superficial ulcers, which readily yielded to the local application of silver and mopping with a solution of chlorate of potash.

The adhesions first commenced to form in January, 1871, at which time she had daily hemorrhages for five weeks, the blood passing from the nose during the night, and from the bowels during the day, causing spanæmia and general debility. Instruments were frequently used by her physicians to tear up and prevent the adhesions, but to no useful purpose. For three months previous to the time I first saw her she had been unable to swallow any solid food; her diet was limited to toast water, tea, and very thin broths.

On June 10, 1872, assisted by Ed. T. Irwin, I dissected the uvula from the posterior wall of the pharynx. The tongue was depressed with a spatula by the assistant. I first made an incision with a long, straight-pointed tenotome, severing the right border of the uvula from its attachments to the right posterior palatine arch and right tonsil. I then dissected the uvula, from apex to base, with the angular bladed knives used in staphyloraphy, from its attachment to the posterior wall of the pharynx. The hemorrhage, which was free, was easily arrested by the sponge mop saturated with water. In dissecting behind the base of the uvula, the small orifice in the soft palate was enlarged to admit the passage of a No. 10 flexible sound into the posterior nares.

I deemed it prudent to desist from further operative proceeding at that time, lest the violence done to the parts might result in sloughting, ulceration and destruction of the uvula and soft palate. I then directed the patient to mop several times daily with a weak solution of alum, taking care to pass the mop well up behind the uvula, to prevent any readhesion, and to inject the posterior nares with the same wash, using for this purpose a syringe having an angular point. The great anxiety of the patient to be cured induced her to faithfully carry out all directions.

In about three weeks the wound had healed, and the uvula, at first rather unsightly, had contracted and retracted to about the average size, and looked quite respectable.

The constitutional treatment at this time consisted of tr. ferri mur., min. 20; tr. cinchona comp., ℨ ij, in sweetened water, every four hours; and hydrate chloral, grs. 15, in solution, at night, to produce sleep, which for a long time had been disturbed.

During the summer and fall she had repeated attacks of superficial ulceration of the pharynx and tonsils, which readily healed after a few applications of argenti nitras, or mopping with tr. ferri mur., diluted. The internal administration of iron was, every few weeks, alternated with the fluid ext. stillingiæ, ℨ ss; potassi iod., grs. 4; hydrarg. biniodidi, gr. 1-20, in sweetened water, three times a day.

Under this treatment all disposition to ulceration of the throat, osseous pains and other general symptoms disappeared.

On the 10th day of November, assisted by J. A. Stratton, I detached the soft palate from the posterior pharyngeal wall. To reach this adhesion, and facilitate and simplify the operation, I had made, by F. S. Siegel, of this city, a special knife. The handle, of wood, is six inches long; the shank, two inches; the blade, one-half inch long, lancet shape, double edged, and set at a right angle with the shank, the edges being transverse to the long diameter of the shank. This knife I found admirably adapted for the purpose; the blade being passed behind the uvula, the apex was forced through the soft palate, then the knife was carried transversely right and left, and the operation was completed in less time than is required to describe it. It was not necessary to use the tongue depressor, as the handle of the knife served for this purpose much better. The hemorrhage was slight and easily arrested. The next object of importance was to heal the wound, prevent any re-adhesion, and make the operation a success. I first bent the handle of a common tablespoon, passed it up behind the soft palate and determined the dimensions of the opening and extent of the passage. I next hammered out a piece of lead, from which I cut a plate one and a-half

inches long and from three-fourths to seven-eighths of an inch in width, the lower end oval, the upper end notched in the centre, with a perforation in each cornua, the plate being slightly curved to rest on the posterior surface of the soft palate and uvula. A piece of hard corded surgeon's silk, about two feet in length, was tied in each opening through the corner of the cornua of the lead plate. I now passed a short piece of silk through the eye of a Belloc's cannula, making a short loop ; then passed the cannula first through the left inferior meatis down behind the soft palate into the mouth, and attached one thread of the plate to the loop in the cannula and then withdrew the cannula as in plugging the posterior nares. The same was done in the right inferior meatus. I next grasped the lower border of the leaden plate with a pair of long forceps, carried it behind the uvula, at the same time drawing the silk threads through the nares with the left hand, when the plate was placed without difficulty in situ between the pharynx behind and the soft palate and uvula in front; the silk strings were passed above the ears and tied behind the head, drawn sufficiently tight to suspend the leaden plate so that the lower margin would correspond to the apex of the uvula. The patient was ordered to syringe the parts several times a day with a weak solution of alum. In a few days the parts were entirely healed, but in order to guard against contractions or re-adhesions I allowed the patient to wear the plate for six weeks, which she did with very little inconvenience, its presence not interfering with either deglutition or perspiration.

I cannot too strongly recommend the lead plate dressing in this and kindred operations; it is worn with ease and comfort, does not obscure the view of the parts at any time, facilitates thorough cleansing and the local application of remedies, and is an effectual barrier to any new adhesions.

This operation, or rather, the conditions requiring the operation, are of unfrequent occurrence. Many of our

prominent authors on surgery do not refer to it in any way.

Dr. J. Solis Cohen, on "Diseases of the Throat"—for whose admirable work I am indebted to the publishers, William Wood & Co., 27 Great Jones street, New York—only mentions three cases: one described by Dr. Wm. Turner, 1860; one by Rudtroffer, in 1805, and one by Otto in 1813. Pieces of lint passed between the separated parts is the only dressing I find recommended to prevent re-adhesion, which, to say the least of it, must be a source of great annoyance and inconvenience to the patient.

Since the completion of the operation my patient has been able to swallow solids without difficulty. She complains of a want of action of the deglutory muscles on the right side of the pharynx, which is due to some contraction, being the sequel of ulceration previous to the time I first saw her. She has had no throat trouble during the winter. —*Med. and Surg. Reporter.*

ARTICLE VI.

The Alumni Associations and their Influences for Good.

It is only within the past few years that the alumni of our different medical colleges have claimed for themselves any existence in fact. From originally small gatherings, these organizations have so increased that active members are scattered all over the country, and will travel scores of miles to attend the stated re-unions. There are many reasons why we should congratulate ourselves on such a state of things. Aside from the good which these meetings do to the members, individually and collectively, in affording opportunities for social enjoyment and professional encouragement, there is much more that can be done for the colleges, and through them for the educational interests of the profession at large. It must not be denied that the alumni associations are becoming foci of immense power and influ-

ence; that they are capable, by the very circumstances of their formation, of creating a healthy professional sentiment for reform which could not be done by any other means, They can in reality be the powers behind the throne, and, if they make proper use of their opportunities, can insist upon changes in the schools, which in the end will redound to the credit of all interested parties. The college must be poor indeed which, after an existence of a score of years, cannot count among its graduates men who have by sheer diligence risen to the front ranks of their profession—men who have obtained for themselves positions which, if their former teachers care not to envy, they must at least respect. These successful men are earnest in their endeavors to lessen these difficulties in their successors which their own hard-earned experiences have verified—they are actuated with the commendable disposition to prepare the future generations of medical men to combat these obstacles more successfully. In such a work they can afford to be independent of mere selfish considerations, with perhaps the single exception of a jealous pride in the success of their alma mater.

The alumni should always have a special influence with their alma mater on this very account. They must be presumed to be the best friends to their own college. There is no element but partiality towards an institution from which they have received their diplomas, and all the suggestion for reform should be so considered by the faculties. If the associations are outspoken in their convictions as to what is right, their opinions should receive all the weight which this acknowledgment of friendship to the governing powers should entitle them.

Already we have had evidences of their influence with respective teachers. On more than one occasion these very associations have taken up the discussion of matters pertaining to the colleges which even the faculties, from purely politic motives, did not dare to touch upon. They have borne the odium of adverse criticism with that independence which a conviction of being in the right alone can give, and have

at last come off victorious, generously sharing the palm with a misguided but repentant faculty. Not only can the alumni of any institution step in at times to maintain a good name, but they are able and willing to increase the reputation and usefulness of these seats of learning. It is within their power to do for a college what it may in a pecuniary sense be incapable of doing for itself. In the shape of endowments, for instance, it can give a practical turn to the suggestions for reform in the shape of extra professorships, increased time for study, and the like, which assistance we can never expect to gain from any other quarter. In more than one of our colleges the initiative in this respect is already being taken with the promise of very gratifying results. This is one of the means to an end which gives us a pivot upon which to turn many of the time-worn suggestions of years past, and will give every one interested in educational matters a real and abiding interest in alumni associations. There are many other reasons why these organizations should prosper, but in our opinion this is the principal one, and if the alumni continue to take an interest in this matter the results cannot fail to satisfy the most sanguine. In order to smooth the way, however, we claim that the alumni association of each college should have a representation in the council: this is simple justice, and in many points of view the smallest possible compensation on the part of the faculties for the ultimate good to be attained.

The alumni associations of our colleges in this city are all in a prosperous condition—are, so to speak, permanent institutions. They number among their members some of the most influential men all over the country, men who know what is wanted in the way of reforms in medical education, and who are capable of backing up their convictions in a practical manner. We cannot believe that when the proper time comes for initiating the necessary changes any one of them will be found in the background.—*Med. Record.*

ARTICLE VII.

The Best Method for Removing the Upper Maxillary Bone.

BY JULIAN J. CHISHOLM, M. D.,

Professor of Operative Surgery in the University of Maryland.

As a surgeon, but more especially as a teacher of operative surgery, I have constantly occasion to consult authorities on the various methods adopted by surgeons for the performance of operations. In reviewing the *modus operandi* for extirpating the upper jaw, I have noticed that in the many works on practical surgery, even the most recent, but one mode of procedure is described. All of these books mention the curved incision through the cheek, extending from the external angular process of the frontal bone to the angle of the mouth; to be modified, if found necessary, by the addition of a horizontal incision running immediately beneath and parallel with the lower lid, and extending from below the inner canthus of the eye to the vertical cheek incision. If required, this horizontal incision may be made mid-way between the mouth and the orbit, extending from the wing of the nose directly outward to the curved incision already referred to. Mr. Ferguson had suggested an incision passing through the median line of the upper lip, then curving around the wing of the nostril and extending upwards in the line where the nose and cheek meet each other to within one-half or three-quarters of an inch of the inner canthus of the eye. When only a portion of the upper jaw is to be removed, this latter incision around the nose appears to be sufficiently extensive for exposing the surface. When a larger surface is to be laid bare, Mr. Fergusson adds this nasal incision to the curved incision extending from the angle of the mouth upwards. This curved incision through the side of the face is open to the very serious objection of leaving an ugly scar, to which is added paralysis of all of the muscles in front of the wound through division of the branches of the facial nerve. When the horizontal incisions are used,

the face is much more extensively scarred and thereby permanently disfigured.

Having for many years taught and practised Dieffenbach's operation for the removal of the upper jaw as the best method, both as the ready exposure of the entire bone and leaving the least deformity as a permanent result, I have been much surprised to find so little mention of this excellent method. Chelius, in his System of Surgery, refers to Dieffenbach's method in one line only. In the more recent works of Holmes, Erichson, Fergusson, Gross, Gant, and others, the operation appears to have been completely lost sight of.

Dieffenbach's operation consists in making the incision in the median line of the face. Commencing at the root of the nose, an incision slits the nose and the upper lip in the median line. A short incision joining the first at right angles, extends from the root of the nose to the inner angle of the eye. The lower line being drawn downwards, the knife is carried along the entire length of the conjunctival cul-de-sac, separating this lid from its orbital connection, and utilizing the entire length of the lower lid in the horizontal flap. When the flap, as defined by the vertical and horizontal incision, is dissected up, it will lay bare the entire front, and, if necessary, side of the face, without having divided any large vessel, or any important nerve branch. With such an exposure the superior maxillary bone can be isolated with great ease as every surface of contact with neighboring bones can be clearly brought into view. With no additional incision I found no difficulty in removing from the living subject the superior maxilla, molar, and palate bone, which enabled me to extirpate a large fibroid with extensive adhesions to the roof of the pharynx. After the removal of the maxilla, when the flap is brought back to its normal situation and carefully adjusted by several points of suture, union speedily ensues. This operation leaves so little deformity that in the majority of cases the line of incision will escape detection unless the scar be sought. In many faces the

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thin skin is so stretched over the bridge of the nose as a normal condition, that it reflects a light as a whitish line somewhat similar to the scar made in this operation. The inferior lid retains all of its movements. The sides of the face present their normal appearances unscarred, with nerves and vessels intact. The eye-muscles can be so nicely manipulated through this bold flap, that all the movements are retained. As the suspensory ligaments of the eye-ball remain adherent to the roof and side of the orbit, there is no drooping of the eye-ball. Immediately after the suture are placed I have seen the patient move the eyes in parallel axis, showing perfect control.

Experience both on the living and dead subject has proved to me the advantages which Dieffenbach's operation possesses over all others designed for the removal of the entire upper jaw. I would recommend to those who may have this operation to perform, to give the method by median vertical incision a trial, feeling assured that those who have once used this better method will not go back to the incision through the cheek into the angle of the mouth, as described in most treatises on surgery.—*Med. Record.*

ARTICLE VIII.

Physiological Effects of Oxygen.

M. Bert, a French chemist, has been conducting a series of experiments with a view to test the properties of oxygen gas as a stimulant. In a paper read before the Academy, at Paris, appears the following practical suggestions :

" Animals," says the author, " were confined in superoxygenated air, the pressure of which was over 2½ atmospheres. Here un unforseen result was met with. When the pressure was raised to four or five atmospheres, the animal gave signs of suffering and fell into convulsions, which were repeated up to the time of its death (in less than half an hour.) These violent effects could not be due simply to pressure, for in common air the animals bore a pressure of

eight or nine atmospheres without inconvenience. They are due to a large proportion of oxygen, which, entering the blood, acted poisonously. To produce the same results by simply using air, it would be necessary to exceed 14 atmospheres. Oxygen, therefore, when its proportion in the blood is notably increased, acts as a poison.

At a later period M. Bert was able to apply a pressure of 20 atmospheres. With common air, the convulsions due to poisoning, by oxygen appeared at 15 atmospheres.

Still M. Bert thinks (and he gives proof of it) the injurious action of oxygen must not be supposed to commence there. It begins to act thus at six atmospberes, or, as more refined experiments may yet show, at even lower pressures.

The benefit derived from use of compressed air-baths on the one side, and many of the accidents that happen to workers in mines, diving-bells, etc., on the other, appear to be due, in great part, to the introduction into the system of a quantity of oxygen greater than in the normal state; and it is with oxygen as with other poisons, small doses of which may be salutary.

If æronauts, who are stopped in their upward course, not by failure in the baloon, but by the impossilility of living, wished to soar higher, they might accomplish this if they took with them a supply of oxygen to which they could have recourse when the air became too rare. The mechanical arrangements for breathing this conveniently can be easily conceived. On the other hand, the industries which subject workmen to pressures over five or six atmospheres, entail suffering and death; which evils might be remedied if there were substituted for the air a mixture of air and nitrogen, calculated so that the pressure of the oxygen should not exceed a certain low limit.—*Druggists' Circular.*

EDITORIAL, ETC.

Decision of the Supreme Court of the United States in the Rubber Case.—In the April No. of *Journal* we informed our readers that Dr. S. S. White, through his counsel, Messrs. Jeremiah S. Black and Henry Baldwin, Jr., Esq's, had succeeded in having set aside the decree of the Supreme Court on the ground of collusion, &c., and thus saving the profession from what they consider an unjust burden. The case is therefore again open for the profession to establish by proof the invalidity of the Cumming's patent. The following from the April No. of the *Dental Cosmos* is the decision of the Supreme Court rendered March 3rd, 1873, and for which the profession owe a debt of gratitude to Dr. S. S. White, as it was in his behalf and through his efforts that the appeal or decision was set aside and the case again opened :

SUPREME COURT OF THE UNITED STATES.

No. 133. DECEMBER TERM, 1871.

Benoni E. Gardner, Appellant, *versus* The Goodyear Dental Vulcanite Company, *et al.*

Appeal from the Circuit Court of the United States for the District of Rhode Island.

On Motion.

Mr. Chief Justice Chase delivered the opinion of the Court.

The original suit in equity was brought by the Goodyear Dental Vulcanite Company against Gardner to enjoin him from the use of certain patented subjects belonging, as alleged, to the Company, and for an account. The case was heard upon a bill, answer, and testimony, and there was a decree in favor of the Company in the Circuit Court for the District of Rhode Island, in September, 1870. Upon appeal to this court the decree below was affirmed on the 6th of May, 1872, but the opinion has not been read. The defense was conducted by counsel originally employed and paid by Newbrough, under whom Gardner was

licensee. On the 1st of July, 1869, before the decree in the Circuit Court, Newbrough and the Company compromised all matters of difference between them, with the understanding that this suit should go on to the final hearing and determination both in the Circuit Court and in this court on appeal, as if the compromise had not been made.

The Company, however, paid the counsel employed for the defense as well as for themselves in Circuit Court, and subsequently in this court. These facts appear from the record and from the admissions of the Company in the ninth article of their answer to the motion to dismiss the appeal. They are the only facts which we think it necessary to notice.

It may be that the Company has not become the legal or equitable owners of the opposing interests involved in the suit. There may be, and doubtless are, large opposing interests of which they are neither the legal or equitable owners. But it cannot be admitted that one party to a suit can pay the fees of counsel on both sides, both in the court below and on appeal, without being held to have such control over both the preparation and argument of the cause as to make the suit merely collusive in both courts. It can make no difference that the counsel fees were charged to the party apparently though not really liable to pay them, and payment from the other party procured through him. This, indeed, is a circumstance against the party who pays the fees rather than in his favor.

The motion to vacate the decree of affirmance heretofore made, to dismiss the appeal, must, therefore, be granted, and an order made to recall the mandate which has been issued to the Circuit Court. We take occasion, however, to say that we see nothing in the conduct of the counsel who actually represented the Company which merits blame, or which ought to affect in any degree the high esteem in which they have been held. Neither of them appears to have had any knowledge of any arrangements made by their client with the opposing party.

True copy.

[SEAL.] Test: D. W. MIDDLETON,

Clerk Superior Court, U. S.

[That there may be no question as to the scope and effect of the foregoing decision, we have procured and append a copy of

the mandate which had been issued to the Circuit Court which is recalled and annulled by the decree on the motion to dismiss the appeal.]

UNITED STATES OF AMERICA, ss.

THE PRESIDENT OF THE UNITED STATES OF AMERICA.

To the Honorable the Judges of the Circuit Court of the United States for the District of Rhode Island, greeting:

Whereas, lately, in the Circuit Court of the United States for the District of Rhode Island, before you, or some of you, in a cause between The Goodyear Dental Vulcanite Company and Josiah Bacon, complainants, and Benoni E. Gardner, respondent, wherein the decree of the said Circuit Court entered in said cause on the 8th day of September, A. D. 1870, is in the following words, viz.:

"Upon the coming in of the master's report, and on motion of the complainants' counsel, it is ordered and decreed by the Court that the said report be confirmed and established, and that the said defendant, Benoni E. Gardner, and his agents and servants, be perpetually enjoined from making, using, or vending to others to be used, any one or more dentures or plates for artificial teeth manufactured according to the process described in the reissue patent, in said bill of complaint mentioned.

"And the Court doth further order and decree that the said defendant do forthwith pay unto the complainants the sum of seventy-five dollars, being the amount of profit found by the said master's report to have been received by the said defendant, Gardner, from the manufacture and sale of plates for artificial teeth manufactured according to the process described in the said reissue patent, in violation of the exclusive right of the complainants.

"And the Court doth further order and decree that the said defendant, Gardner, do pay to the said complainants the costs of this suit, taxed at two hundred and forty-eight dollars and eighty-four cents ($248.84), entered as the decree of this Court, per order thereof, this 8th day of September, A. D. 1870."

As by the inspection of the transcript of the record of the said Circuit Court, which was brought into the Supreme Court of the United States by virtue of an appeal, agreeably to the act of

Congress, in such case made and provided, fully and at large appears.

And Whereas, in the present term of December, in the year of our Lord one thousand eight hundred and seventy-one, the said cause came on to be heard before the said Supreme Court, on the said transcript of the record, and was argued by counsel: On consideration whereof, it is now here ordered, adjudged, and decreed by this Court that the decree of the said Circuit Court in this cause be and the same is hereby affirmed, with costs and interest until paid, at the same rate per annum that similar decrees bear in the courts of the State of Rhode Island, and that the said complainants recover against the said respondent, Benoni E. Gardner, three hundred and ninety-nine dollars and nineteen cents for their costs herein expended, and have execution therefor. *6th May*, 1872.

You, therefore, are hereby commanded that such execution and proceedings be had in said cause, as according to right and justice, and the laws of the United States, ought to be had, the said appeal notwithstanding.

Witness the Honorable Salmon P. Chase, Chief Justice of said Supreme Court, the first Monday of December, in the year of our Lord one thousand eight hundred and seventy-one.

Costs of complainants: Clerk, $379.19, Attorney, $20.00. Total, $379.19.

Taxed by D. W. MIDDLETON,
C. S. C. U. S.

SUPREME COURT U. S. DECEMBER TERM, 1871.

Costs of the Goodyear Dental Vulcanite Company *et al.*, in No. 133, 1870.

$379.19; Fee book L; pa. 378; Test.: D. W. MIDDLETON,
C. S. C. U. S.

1872, May 14. Received payment, per A. POLLOK, Esq.
D. W. MIDDLETON,
C. S. C. U. S.

THE BENONI E. GARDNER APPEAL CASE
IN THE
SUPREME COURT OF THE UNITED STATES.

"The evidence in a suit, when only one party is heard, is straighter than a line." *Hindu Proverb.*

In the June number of the *Dental Cosmos* we endeavored correctly to exhibit the procession of events and the persons concerned in the decision obtained in the above case in the Supreme Court. We quote the conclusion of that article:

"What all this brings us to in the present relation of dentists to vulcanite work and the patent which controls it. The Goodyear patent expired May 6th, 1872. On that day this decision was announced, which gives to the Cummings patent a standing in court which deprives individual dentists of any hopeful chance of resisting them.

" There is naturally due to a decision of the Supreme Court of the United States a certain weight and effect which this one will fail to secure permanently. We charge that the parties by whom this case has been made up have committed a deliberate contempt upon this highest tribunal of our country; that they purchased this case, so as to control it; that since its purchase, they have directed both sides of it, for the express purpose of gaining a decision rapidly and safely. Reckless of the dignity of the courts through which they have worked; reckless of the interests of thousands of dentists whom they plotted to entrap in meshes from which they now represent that there can be no escape; reckless of the professional honor of their own ablest advocate; reckless of everything but the success of their plans, and their selfish greed for a harvest of plunder.

" We charge that in this case, since the settlement of the Goodyear Dental Vulcanite Company with John B. Newbrough, July, 1869, there has been no veritable plaintiff, because they were bound by that settlement to give a full license to the man whom they are, in this suit, pretending to sue for infringement. There has been no veritable defendant, because B. E. Gardner was licensed, and protection for him secured in Newbrough's contract.

" We charge that this case has, ever since July, 1879, been collusive, and that it is a fraud upon the courts, and upon those against whom this decision is now sought to be enforced, and has never had any color of verity, except that which it obtained through the misguided efforts of those dentists who aided in giving it that semblance by their action just previous to and at the hearing.

" Such a decision—a decision so obtained—is not entitled to,

and will never receive, the deference and respect of intelligent, law-abiding, and equity-loving citizens.

"The proofs of collusion and fraud, which have gathered and hold, are safe beyond the possibility of concealment or purchase. They are ready to aid whatever resistant action the dentists of the United States may decide upon or be advised to take; whether that shall be to seek a rehearing of this badly prepared case, or to claim a fair hearing on a new one.

"Be sure that when presented, the Court will listen to them, and that this decree of May 6th, 1872, will NOT BE FINAL. We advise our friends not to believe it, not to submit to it, nor to think of it as FINAL. Dentists should cease the use of rubber, and refuse to take or pay for licenses. Half-way measures will not do now. The refusal must be absolute, and it must be general. Let us test the question whether there is in this great body of educated men enough self denial to make this course a success.

"If this feeling and determination is established in the minds of individuals, it will be communicated from one to the other, extend to local meetings and conventions, and become accepted and recorded as the decision of these primaries.

"Out of these a league may be formed, and a national organization set up, which will exert an influence strong enough to draw in the wavering, and those who have calculated upon making profit out of the abnegation of their brethren.

"Ultimately, with a careful selection of leaders, wise forethought, the best and ablest counsel in all the land, and the abundant means which a very small contribution of a host of members will aggregate, this Goodyear Dental Vulcanite Company shall suffer first the extinction of their revenue, and then a trial, which will extinguish the title of their Cummings patent."

Convinced of the truth of the foregoing charges, and seeing how much oppression by fraud might be perpetrated under this decree of the Supreme Court, we thought it our duty to inform the Court of the facts, and procure a rescission of its decree, and thus save the profession from the necessity of passing under a yoke prepared for them.

Accordingly, we sought the advice and aid of counsel, who, upon examination of the case, assured us that the law could not

thus be evaded and prostituted by corrupt men. In the interest of the dental profession not parties to the suit, but whose rights might be seriously affected, we caused the facts to be laid before the Supreme Court of the United States, and asked that the decree should be stricken out and the appeal dismissed, on the ground of the collusion and fraud before mentioned. The Court saw how it had been imposed upon, and granted our prayer.

The fact that the Company in question resorted to foul play shows that they themselves were conscious of having a bad hand; otherwise they would not have relied upon "ways that were dark" and tricks that turned out to be vain.

We have given a full copy of the record of the proceedings on our motion, to verify our statement, and to show that we charged *before* this motion was made has been proven. To the mind of a candid reader, we think the record exhibits in a most unenviable position the parties concerned; but if it furnishes any ground for charity, we give them the benefit of it.

This decree, in which Mr. Justice Clifford himself concurs, negatives, neutralizes, and nullifies the effect of the decree of the Circuit Court of Rhode Island, supersedes the impending affirmance of that decree by the Supreme Court, and thus obviates the difficulties which would otherwise have been in the way of any subsequent or further endeavors by the profession to obtain a hearing upon the real merits of the case.

It is sufficient to say that all questions have been, or are, or may be, material or relevant in connection with the Cummings Patent, and the rights of the profession in view of that patent, are now and thus open and free for discussion by and in behalf of the profession, for establishment by proof, for argument by counsel, and for adjudication by the courts.

Of our own course in connection with this appeal, the action of the Supreme Court of the United States is sufficient explanation and vindication, correcting as it must all misapprehensions, neutralizing all misrepresentation, and showing in the light of a complete triumph to what interest our efforts were devoted, and with what effect. Working alone, and assuming the sole and entire responsibility, we resorted to the only means left available to foil the well-planned scheme of that appeal, by laying before the Court, immediately upon the opening of the adjourned term,

the facts which have led them to the decision that now takes the place of the affirmance that would otherwise have been promulgated. This affirmance, once promulgated, would have rendered it virtually impracticable to reinstate the profession in the advantageous position which it now occupies. The proceeding itself, and its result, are without precedent in the history of the Supreme Court. Never before has there been a case in which an appeal was fully argued, a decision made, a decree affirmed, and the affirmatory mandate issued, and then the decree of affirmance vacated, the opinion withheld, the appeal dismissed, and the mandate recalled, upon the ground that the suit, both below and above, was "MERELY COLLUSIVE."

SAMUEL S. WHITE.

Rubber Dam and its Application.—In the *Dental Advertiser* Dr. G. C. Daboll explains his method of applying the "rubber dam" as follows:

To young operators, or to older ones, who have had little experience in the application of the rubber dam, many difficulties are presented which seem almost insurmountable, especially when they are obliged to operate without an assistant. This is owing almost entirely to its peculiar nature, which renders it so difficult to keep in its position until it can be secured. It is a simple matter to make a hole in the rubber and stretch it over the tooth, but it is quite another to hold it there until it can be forced into a safe position. Having been through all the phases of this difficulty, and arrived at a fair degree of success, I herewith give some of my experience, hoping it may be not without profit to some who are still having trouble. One should be provided, first, with a strong thread or twine that will bear strain enough to carry it between the closest and most firmly set teeth. In my own practice I have found saddlers' thread, thoroughly waxed, to answer an admirable purpose. Each ligature should be from twelve to twenty inches in length, and it is well to have several cut off and prepared before commencing the operation, in case of emergency. The first step taken is to pass the ligature through all the spaces between the teeth over which it is proposed to put the

dam, and in almost every operation it is advisable to put it over from two to four teeth. The object of carrying the ligature through first, is to ascertain how close the spaces are, and to carry any little points of calculus or other deposit that may be on the approximal surfaces, and also to get a correct idea of the difficulty one has to contend with.

Taking, for instance, the second left inferior molar, which, in the average mouth, would be rather difficult, and supposing the operator to be alone, the *modus operandi* would be to prepare the rubber for four teeth, the bicuspids and molars, leaving a margin wide enough from the holes, so that when the mouth is open the edges will come well up over the upper lip and the corner of the mouth. Now carrying the first hole over the first bicuspid, well down on the lingual and buccal surfaces, direct the patient to place the index finger of the left hand on the buccal surface of the tooth, with an injunction to hold it steadily and firmly; after that is in position repeat the operation with the index finger of the right hand for the lingual surface. With a little care most patients readily get the idea and but little difficulty will be experienced in making them understand what is wanted. Now carry the ligature firmly down between the canine and the bicuspid, laying it across the crown of the bicuspid and sliding it to the space, to be sure that a double thickness of the rubber is not carried down. Now draw this ligature through until just the end is left, and cut it off, the end remaining in most cases being amply sufficient to secure the position. Repeat this process on the second bicuspid and first molar, which will ordinarily be easier; the real trouble commencing when we reach the second molar. The ligature being carried down between the molars—there being no dens sapientia—it should be left there; then carrying the last hole over the molar, hold the rubber with the index finger of the left hand, and with the foil carriers, or an instrument, carry the ligature around the distal surface, bringing both ends together, and direct the patient to hold them firmly, having taken care that it is sufficiently well on the tooth to prevent its being pulled off, now, with a point bent at an angle sufficient for the purpose, make sure that the ligature is carried down below the swell of the crown, and direct the patient, after getting the instrument

in position, to hold it there while the knot is tied. After a trial or two it will be found easy to tie the knot on the distal surface, making it still more secure than if tied on the buccal surface. This represents as difficult a case as one ordinarily meets with, much depending on the mouth and the patient, as regards the ease with which the molars can be reached; much depends, also, on the patience and perseverence, to say nothing of the ingenuity, that is required of the operator. Many little points are to be observed in the management of the rubber. The care required in making the holes, in spacing them so that when carried down between the teeth it shall fill the space closely at the margin of the gum—otherwise the stretch will render it so narrow as to cause a leak. Whatever may be the result of a first trial in any case, don't let a failure discourage you, but avail yourself of the knowledge born of experience, and try again. It will pay, for operations that were formerly considered impracticable are, by this simple appliance, rendered as easy as the simplest.

Dr. Arthur's Instrument.—Several letters having been received asking for information concerning this instrument, or "dental tool" as it has been designated, we reply that it is a thin corundum wheel, for separating teeth, one-half to one inch in diameter, drawn nearly to an edge on the periphery, either perfectly flat, or slightly beveled toward the centre, and adapted to be rotated between the teeth by a dental engine, either Morrison's, or Green's.

MONTHLY SUMMARY.

Application for Chilblains.—F. Rhien recommends an aqueous solution of iodine and tannin as a remedy for chilblains. He says that the result exceeded his expectations, five applications of the remedy being successful. The application has also been tried by others, with good results when properly applied. The solution is made as follows: about an ounce of tannin is dissolved in half a pint of water; seventy-four grains of iodine are dissolved in an ounce and three-fourths of spirits of wine; the two solutions are then mixed, and enough water is added to make up the whole to two and a half pints. The remedy is applied once daily, the best time being before going to bed. The mixture is gently warmed over a very slow fire; the affected part (*e. g.*, the hand) is dipped in it while still cold, and held there until the liquid, on being stirred, feels uncomfortably hot. The vessel is then removed from the fire, and the hand is dried over it, without gloves. The vessel used must be of earthenware or porcelain, not of metal. Care should be taken not to use too great a quantity of iodine, especially when abrasions are present. According to Rhien, four or five applications are sufficient.—*Apotheker Zeitung.*

Chromic Acid.—Dr. J. Dougall supports warmly the value of chromic acid (anhydride) as an antiseptic, disinfectant, and germ-preventive. Its coagulating power is about 10 times that of carbolic acid, 15 times that of nitric acid, 20 times that of corrosive sublimate, and 150 times that of chloralum. Its reaction with gelatine is as delicate as that of tannic acid, giving a response with 1 in 5,000. Chromic acid is well adapted for estimating albumen volumetrically, thus: Fill a wide-mouthed burette to a multiple of 100 with the albuminous liquid (say urine,) add solution of chromic acid (4 grs. to ℥i) in slight excess; shake, set aside for 24 hours and read off. Carbolic acid does not combine with ammonia or sulphuretted hydrogen; chromic acid does. *Lancet.*

Tea vs. Brandy.—The question of replacing brandy by an allowance of tea is occuping the serious attention of the Russian

military authorities. According to the *Viedomosti*, of St. Petersburg, the Minister of War has submitted the question to the deliberation of "Specialists," who, better than any one else, can appreciate the utility and the results produced by brandy and tea. The general opinion in military circles is strongly in favor of the use of tea; but it appears to be doubted whether it can take the place of brandy without causing too great an excess in the budget set down for the maintenance of the troops. It results from calculations made by Dr. Steinberg that an annual ration of tea and sugar would cost 322 roubles 15 copecks for every 100 soldiers, while a ration of brandy costs only 30 roubles 60 copecks; the difference being 282 roubles 55 copecks. The pound of tea is estimated at four francs; and the Russian army numbers, as we have recently been told, about 1,500,000 men on peace footing; it is therefore highly probable that the military authorities will take some time to consider the advisability of adopting such a costly change.—*Med. & Surg. Reporter.*

Carbolic Acid as a Local Anæsthetic in Boils, Whitlows, etc.—Dr. J. N. Taylor writes to the *Nashville Medical Journal*:

"I have frequently used carbolic acid in minor surgery, but not until recently to my great satisfaction.

"About the middle of November of last year I was the subject of a very large and painful boil, on the ulna side of the forearm. I saturated a piece of worn linen in an aqueous solution of carbolic acid, and applied until all sensibility of the part had ceased; then, with a piece of ordinary writing paper, twisted to a sharp point, and dipped in a solution of the acid (full strength,) marked out the line of the desired incision; then, with an ordinary scalpel, I made a free incision, fully an inch in length, without any pain whatever.

"I greatly prefer the application of the acid thus used to the freezing process."

Danger of Morphine Injections, with Chloroform Inhalations.—A good deal has been written about the union of morphine injections with chloroform inhalatious to produce prolonged surgical operations. M. Demarquay concludes, from a short series of experiments, that it is a method liable to especial dangers, arising from lowering of the temperature.—*Med. Record.*

Singular Causes of Death.—The last publication of the British death rate and its causes is curious reading. One man died from the bite of a cat; and two more from the bites respectively of a ferret and an adder. Another was stung to death by bees. A man and a boy died of falling from velocipedes, and and an old

lady was killed by injuries inflicted by that agreeable machine. The swallowing of a shell, a screw and a cherry-stone, put a period to the lives of three infants, while two died of putting one a stone, the other a bead into the ear. Swallowing bones sent three people out of the world, swallowing coins finished two, and swallowing a pin quickly pricked on grim Death for one. A scratch from a thorn killed a woman of middle age; improper medicine poisoned eight people, and improper food five; 444 young children were smothered by bed-clothes, and 930 persons during the year lost their lives in railway accidents. The proportion of suicides to every million of the population is about 70, the deaths by hanging, the knife and drowning being most numerous. Heart disease the year's record shows to be increasing, a state of things which is said by eminent physicians to be caused by the greater wear and tear of business and the increased mental activity of the age.—*Med. & Surg. Reporter.*

Anodyne Colloid.—Dr. H. M. Lackersteen gives (*Brit. Med. Journal*) the following formula for a topical anodyne colloid which he has found useful in neuralgia, sciatica, lumbago, all muscular pains, etc. It relieves local pains for the time, and procures a good night's rest. ℞.—Hydride of amyl, ℥ j. aconitia, gr. j; veratria, gr. vj; ethereal collodion to ℥ ij. The amyl, by its rapid volatilization, often produces, almost instantaneously, the desired result: but, should the pain continue the alkaloids can be brought into activity by applying a piece of moist spongiopiline over the collodion film. The amyl hydrid is the only new ingredient: but I think the colloid is a clean and elegant preparation.—*Med, News.*

Hops as an External Preparation.—If possessed of any virtue as an anodyne, and popularly hops have great reputation as such, the effect is best obtained by *steaming* a muslin bag full of them, on the side to be applied to the body, until quite soft and damp—not wet.

The ordinary method of wringing out in hot water wastes all the strength of the hops, and makes a nasty mess.—(*Druggists' Circular.*)

THE

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ARTICLE I.

Georgia State Dental Society.

The regular annual meeting of this body assembled in the skating hall of the Rankin House in Columbus, April 2nd, 1873, at 10 o'clock A. M., Dr. E. M. Allen, of Marrietta, President, in the chair.

Drs. W. J. Fogle, W. T. Poole and T. W. Hentz, of Columbus, and J. L. Fogg, of Barnesville, were elected to active membership. Dr. Ford, of the committee on operative dentistry, made report and spoke particularly of the Morrison dental engine, mentioning the important points of its greatly facilitating operations, and giving less pain to the patient. He recommended the machine to all. Drs. Holland and Lowrance spoke of it in the highest terms.

Dr. Parsons enquired how members fill molar crown cavities where the nerve is nearly exposed.

Dr. Campbell, of Barnesville, used Hill's stopping on the floor of the cavity dipped in carbolic acid or creasote, and had more success than in any other way.

Dr. Ford made statement of his filling a first inferior molar on the grinding surface, as follows: Excavated thoroughly

with the Morrison engine, except leaving a small portion of partially decayed dentine over the pulp, flowed the cavity with creasote, and covered its floor with bibulous paper, about three thicknesses, saturated with a solution of pure rubber dissolved in chloroform, after allowing the chloroform to evaporate, filled the cavity with cement Plombe; there was no pain caused upon the introduction of the filling.

Dr. Fogle used Hill's stopping saturated with chloralum and creasote.

Dr. Tigner asked what the physiological action of creasote was.

Dr. Parsons said it contracted the blood vessels, and relieved the pulp of its engorgements.

Dr. Tigner desired to hear the remarks or experience of members upon the use and application of the rubber dam. Treatment of teeth where the pulps are exposed. Capping and devitalizing pulps—which the surer practice.

Dr. Ford herewith expressed himself in glowing terms with regard to the great utility of the rubber dam. It could, he said, with care and perseverance, be applied to any tooth, and was of incalculable service, and to him almost indispensable for the performance of perfect, especially if extended operations. In cases of difficulty of application, such as upon a conically shaped lower molar, he used the Spankler rubber clamp by first pressing it through the rubber, then placing the clamp well down upon the neck of the tooth and forcing the rubber below it with a burnisher. In cases of extreme hypersensitive dentine, he found great advantage in applying the rubber and keeping the cavity dry while excavating.

Dr. McElhaney considered it one of the greatest advantages yet gained in operative dentistry, and thought Dr. Barnum merited the thanks of the whole profession. A motion was made and adopted that a clinic be had at the office of Dr. Fogle for the special purpose of demonstrating its different modes of application for the benefit of those who have heretofore been unsuccessful in its application. Dr. Ford

was requested to act as demonstrator. At the clinic the most difficult application was to a right inferior third molar which was both somewhat retroverted and inclined lingually and conical in form, the cervical portion being the largest; after perforating the rubber he passed the claws or beaks of a Spankler clamp through—took hold of the clamp with a small pair of forceps—folding the rubber back over them, forced the clamp down in position, and then with a burnisher worked the rubber below the beaks of the clamp. The application was perfect and demonstrated the great utility of the rubber dam in difficult cases.

As to treatment of exposed nerves, Dr. Ford had followed the practice of capping with cement Plombe for years, and had been so successful found no necessity for a change. He vitalized pulps in comparatively few cases—treated front teeth successfully that had been ulcerated for years.

Dr. Tigner had capped nerves but had been unsuccessful —thought it better to devitalize and remove; he used creaote freely and had been very successful.

Dr. McDonald had capped nerves successfully with lead.

The discussion then turned upon ulcerated teeth, wherein Dr. Parsons remarked, pus in the canal of a tooth cannot pass through the foramen unless forced, but gases generated by decomposition may and produce inflammation in the surrounding parts. Unhealthy pus was decomposition of the pulp and is dark, while healthy pus was white.

Dr. Holland agreed with Dr. Parsons, but could not accept the term "healthy pus."

As to gravitation of pus of which Dr. Tigner had spoken, Dr. Ford said it would no sooner gravitate downward than upward, but would make its exit through the orifice which by nature was most practicable.

Dr. Fogle said the more important point for us to discuss, is how to get rid of the puss after its formation.

Dr. Ford had seen teeth replaced with success after the necrosed apex had been excised.

Dr. Parsons made the following remarks: He claimed to

have discovered a nervous property in the article gaultheria or wintergreen, which when properly used, is a good substitute for common anæsthetics. He uses it in the form of essence,—four ounces of the oil to one quart, ninety-five per cent. alcohol—applies a little on a napkin, directs the patient to inhale through the nose, and continue until the scalp becomes blushed. Consciousness is not at all suspended, but nervous sympathy controlled so that teeth may be extracted with very little or no shock to the nervous system. He did not claim that no local pain was felt, but that by its use, the most nervous person is abundantly able to bear extraction. It is also excitant for bathing the external parts affected in cases of facial neuralgia.

Dr. Ford spoke at some length on the endowment of one of the Southern dental colleges.

Dr. Poole expressed a willingness to contribute annually for ten years if an endowment was decided upon.

Dr. Shackelford also expressed a willingness to contribute annually.

Dr. Parsons thought it best to give as much as we could all at once, that the faculty could not depend upon subscriptions—the amount raised should be $150,000 or $200,000.

Dr. Ford said it was the purpose to send a circular to each Southern dentist in relation to the endowment.

After discussion of some length, Dr. Parsons offered the following, which was unanimously adopted.

Resolved, that this Society heartily endorse the action of the Southern Dental Association in raising an endowment fund to endow a Southern dental college, and will use our best efforts to bring the scheme to a practical issue.

Dr. Ford of the committee on legislation, read the Act of the last Legislature regulating the practice of dentistry in the State.

At clinics, Drs. Ford, Holland, McElhaney and Jobson, operated.

The following officers were elected for the ensuing year:

President.—A. C. Ford, of Atlanta.

1st Vice President.—I. W. Hentz, of Columbus.

2nd Vice-President.—G. W. McElhaney, of West Point.

Corresponding Secretary.—M. S. Jobson, of Perry.

Recording Secretary.—L. D. Carpenter, of Atlanta.

Treasurer.—H. A. Lowrance of Athens.

Standing Committees for the ensuing year were appointed as follows:

Physiology and Dental Histology.—J. P. H. Brown, of Augusta, and George Paterson, of Waynesboro.

Dental Pathology and Surgery.—M. H. Thomas, of Monroe, and E. Parsons, of Savannah.

Dental Chemistry and Therapeutics.—F. Y. Clark, of Savannah, and R. I. Hampton, of Rome.

Operative Dentistry.—E. M. Allen, of Marietta, and R. A. McDonald, of Griffin.

Mechanical Dentistry.—W. J. Fogle, of Columbus, and J. L. Fogg, of Barnesville.

Dental Education.—F. Y. Clark, of Savannah, and M. A. Shackelford, of Hogansville.

Clinical Committee.—R. A. McDonald, of Griffin; M. S. Jobson, of Perry; W. I. Poole, of Columbus; and H. A. Lowrance, of Athens.

Committee of Arrangements.—Samuel Hape, J. I. Campbell, and L. D. Carpenter, of Atlanta.

A new Constitution and By-Laws were adopted which fixes Atlanta as the regular place of future meetings

M. S. Jobson, *Corresponding Secretary.*

ARTICLE II.

The Action of Cohesive Foil Under the Instrument.

BY E. L. HUNTER, D. D. S., ENFIELD, N. C.

We beg the patience of our brethren in the endeavor to set forth a few principles relating to the action of cohesive gold foil under the plugget, together with a few strictures. It is designed as a reply to Dr. M. S. Dean's article in the

Dental Cosmos for March, 1873, headed "Large Crown Cavities with Walls Unbroken."

A free, bold exchange of opinion is often fruitful of good. It is a search for truth, and not either egotism or want of respect for the doctor's ability, which prompts us to pursue this subject. A clear view of a few mechanical principles is chiefly what is necessary, out of the light of which many an "imperceptible space" has been made. We were asked when cohesive foil under pressure, ceased to draw upon itself. That question is a very important one; our answer is, under two conditions: 1st, when from the form of pellets, it has been reduced to absolute solidity; 2nd, *when it has received its greatest pressure prior to absolute solidity*; and the latter is the condition we have most to do with. *Let each pellet be introduced with the greatest force which is ever to come upon it*, let it be accurately adapted to the walls, and it will remain so. On the contrary, introduce several pellets with moderate pressure, and then condense with a greater force, or introduce with a large point, and condense with a small one, which is nearly the same thing; of course there will be a drawing from the walls for the very same reason that a pellate draws in laterally under the first stroke of the point

Is gold foil elastic? After it has assumed somewhat the density of a plug, it is sufficiently so to effect our operations either for good or evil. If it be used to create pressure against tooth walls, to a certain extent it is good, but if used in such a manner as to rebound from them, it is evil. It was long successfully used by being set up with the wedge between parallel walls in the centre of non-cohesive fillings, being made to press the gold outward against the walls, which so far as the filling of cavities goes, is the wedge proper. But if this elastic pressure be made use of on the margin of a cohesive filling where a V shaped space has been left, in which is to be condensed "light unannealed foil," which is to be "held in by overlapping cohesive gold;' what is to become of the soft foil when the overlapping co-

hesive (gold) " is removed rather by the process of finishing or attrition, (the cohesive being imperfect on one side,) and the *pressure* is to bear, which is far from 'lateral' on either, but at right angles to a line of its sides?—V shaped wedges never remain where they are driven, unless there is something more than usual to hold them there. A wedge which is designed not to fly out as a result of somewhat contending pressure, would have to be very much sharper than a V: in fact a V shaped substance could hardly be called a wedge.

We think there are better methods, particularly when the work approaches completion, of filling up this elastic pressure against tooth walls; then it is made to act from a floor of perfect cohesion, if the floor is concave, (*slightly*) the pressure may be small; if level, it may be greater, that is so far as a condition prior to absolute solidity is concerned. In this condition there may be nice adaptation to the walls, and also ample solidity of the gold *without great* pressure, whereas when a wedge is used next to walls, if there is solidity, there must be great pressure, which might not be very desirable. When there is either a level or slightly concave surface, one has almost absolute power over lateral pressure with the privilege of solidity. If the gold is both plastic and cohesive, the most accurate adaptations may be made to the walls. I suppose a cavity nearly full—place one end of a section of wall ¼ inch long on the centre of the work, take the smallest point you intend using (Voney's wax is small enough ordinarily,) and condense every part of it, which is over the filling, commencing at the centre and ending at the periphery; there will then be a part of the pellet standing up by the wall, turn the end of this down on the work and condense as before, then drive the remainder down and directly by and touching the wall. If more elastic pressure is wanted, do the malleting on this slightly elevated peripheral ring with a smaller point. If you increase the length of this ring, it will not matter practically, unless you carry it on quite out of reason. Its increase in length is almost entirely produced by a slight swell outward, and

even with the point where the blow is struck. Where gold foil is manipulated in this manner, we have never seen even a stain to show that there was not accurate adaptation. If one is compelled to use gold which is annealed to hardness, against thin walls, we know no method not attended with great uncertainty. To this condition of harshness is due many failures, it cannot be accurately adapted to the walls without more force than it is always judicious to apply, unless the pellets are so small as to make the operation too tedious. We think if the gold beaters would give us some unvarying rule by which we can re establish the cohesiveness of thin gold when it has been lost, without destroying its plasticity, that they would greatly benefit us. The methods among dentists generally, are somewhat slow, and attended with some uncertainty. We could suggest some arrangement with a thermometer.

Improper annealing and untimely condensation has been our stumbling stone, and observation compels us to think it has been the same thing with many others, even including Dr. Dean, who thinks that "margins" can be made perfect only by the principle of wedging.

SELECTED ARTICLES.

ARTICLE III.

Furrowed Enamel in Connection with Syphilitic and other Exanthematous Diseases.

BY S. P. CUTLER, M. D., MEMPHIS, TENNESSEE.

Case 1.—A lad, about 17 years of age, under size, Scottish parentage and birth, has rather a scrofulous appearance, sallow complexion.

The six front teeth, above and below, are all deeply grooved near the cutting edges, three grooves across each on front side, with intervening deep pits, with marked uniformity in all, there being scarcely any difference in the order of grooving and pitting; the cutting edges in all deeply notched, narrowed, and contracted. The teeth, between the grooves and gums, are perfectly developed, smooth, and sound; none of the pits or grooves decayed. The sixteen teeth, back of the twelve spoken of, are well developed, and sound, except one upper 6 year molar, which was badly decayed, and had to be removed. This was owing to the fact that these teeth were not yet far enough advanced to suffer from the dermal disease which I am about to describe, which will equally apply to the other cases mentioned, and all other similar cases, whether the effect of the one or the other varieties of exanthematous diseases, discussed in this paper.

The father of the boy has a similar sallow look as the boy, though stout and healthy, only subject to bilious disturbances. The mother is a stout healthy woman, and the mother of a large family of healthy children. The temperaments of both father and son are sanguine bilious.

The following is the history of this singular case:

The boy, up to three months old, was perfectly healthy and robust. At that age, the child was vaccinated with spurious or bad matter, which came from London, the family residing in Glasgow, Scotland. At first the sore progressed favorably, though phagidenous. As the sore began to heal, a breaking out, all over the body, began to make its appearance, which, from the description, resembled secondary syphilis. The doctor, supposing the matter to be fresh from the cow, had his suspicions excited concerning its genuineness, and at once put the child under treatment, though a long time elapsed before the eruptions disappeared; the child becoming, and continuing sickly, until they started to America, the patient being then nearly three years old, and without any signs of teeth in his jaws. After they had been

on shipboard about one week, the child began to want to eat everything he saw, after which time he began to cut teeth. The father did not recollect whether there was anything peculiar about the first set of teeth, only that they were defective. It is but reasonable to conclude that the first set were defective.

This is an interesting case, and would lead to the conclusion that the vaccine matter must have been taken from a syphilitic subject, as there never had been a case of syphilis known in any of the ancestry on either side. The physician at Glasgow believed it to be a mixed case; he did not use any more of the vaccine matter, nor any of the matter from the child's arm, as he had intended to do. This, then, might be regarded as a mixed case, of vaccine and syphilitic poisoning, combined; the vaccine disease running its usual course, the sore being chancrous, subsiding with secondary syphilis, which was ultimately cured, by the treatment while in Scotland.

I believe it is a well established pathological fact that no two acute diseases can run their course, in the human organism, at the same time, or together; the weaker one must lie dormant until the more energetic one has run its course; then the other may run its course, unless the cause of the one be overcome by the energy and activity of the other. There may be cases where two acute diseases, of a specific character, may run their specific courses in succession, as in the case under consideration, the one waiting for the other to run its course. In the above cited case, one disease took on its only form, the acute, while the other took on the secondary; as a sequel, if I may so express it, to the acute form of the other.

It is now, I believe, generally admitted, that when secondary syphilis is inoculated into the system of a second person, that the disease manifests itself only in the secondary form, passing entirely over any acute or initiatory symptoms or tage—not even producing true chancre. The above cases did simulate true chancre, though a mixed case, neither,

perhaps, being absolutely genuine, the protecting power of the vaccine being questionable,

Does not the above case point out, clearly, the close and intimate relation between the enamel of the teeth and epidermis, and inferentially, that of the dermis, or true skin, and the dentine? The two former being exuvious in character, the enamel being retained in consequence of its hardness, both being vital and non-vital, desquamation of epidermis not taking place so long as there is any vital connection remaining. The scaly eruptions over the body of the child continued over twelve months, and under treatment during the whole time, which accounts for the non-appearance of teeth up to the third year, which is a very extraordinary occurrence, and distinctly points out the dermic connection with the dental tissues.

This case more fully convinces me that my former views, already published, were correct—that is, that the teeth embody, or represent, with themselves, the three great divisions of the animal economy—the neuro-dermal, and the dermal; the pulp, with its nerves and blood-vessels, direct from two of the three great vital centres, the brain and heart, the lungs forming the third vital centre, not represented in the structure of the dental organs.

Extensive capillary blood-vessels, veins, and arteries, as well as nerve-fibrils and plexuses, ramify extensively through the skin, similar to the dental pulp, the arrangement of the nerve fibrils, in the latter, forming, to some extent, an exception, as they project through the pulp into the dentinal tubuli, up to the enamel, and cementum, or crusta-petrosa, the blood-vessels stopping at pulp boundaries.

In the above case, the twelve teeth have thin edges where the plates of enamel met, from opposite sides, are defective in development at those points. The balance of the teeth, having broader grinding or cutting surfaces, where the enamel is much less in proportion to the dentine, were not at all affected by the disease. There was an arrest of enamel development, from want of germinal matter, or nu-

trition, in the enamel's basement membrane, or *primus formatibus*, of the twelve teeth named, or at least a want of normal ossification, at the points of those teeth. I have assumed that there was a want of proper nutrition during the developmental stages of these teeth. In saying this much, I do not assume it as a *dictum*, only an hypothesis, with good reasons to sustain my position.

We have in the above a clear case of neuro-dermal resistance in the dentine, of the sixteen teeth not affected by the taint, and portions of the others, to the influence of the disease. Only where the proportion of the enamel to dentine is greatest, is there any defective development.

Scarlatina, measles, and other varieties of exanthemous diseases, are known to produce similar conditions of the teeth, at certain ages, in favorable temperaments, while others will be wholly exempt from any such sequela. The same may also be said of inherited syphilis; some children may inherit the disease, while others will be wholly exempt from any taint whatever, apparently.

I saw a case the other day, a lad thirteen years old, who had measles at the age of three years, with the four six-year permanent molars, on their grinding surfaces, deeply pitted, with sharp points studding the entire cutting surfaces, the borders of which were grooved and narrowed, the defects being confined to the enamel alone; all the other teeth were natural, except the upper central incisors, which had a broad notch in the middle, or cutting edge, of each; teeth all sound and well developed, though the jaws were not in proportion, being narrowed, causing some irregularity and crowding at the site of the canines. There were no indications of any syphilitic taint, in this case, or even suspicions. Published observations, on the part of medical men, are very meagre, and hospital reports, up to the present time, are not sufficiently extensive to base conclusions upon, on this subject.

It is well known that all exanthematous diseases are of a specific character; though all belonging to the same family

of diseases, neither one is protective against either of the others, except that of vaccine, which, is a modification of variola, brought about by the modifying effects of vaccination.

None of the other forms of exanthema, are susceptible of modifying exemptions, except immunity from subsequent attacks, as a rule, to which, like all other general rules, there are exceptions.

Syphilis, so far as known, is received into the system by inoculation only, except by hereditary taint, from parents, So far as is known, this disease is never contracted through the lungs, by contaminated atmosphere. This disease is, at first, only a local sore, of a specific character, remaining local for an indefinite period, varying in different individuals, owing to idiosyncrasies, being carried through the system by absorption of the local virus, which is cumulative in character—*a true ferment*, capable of re-developing itself, as it pervades the tissues, appropriating to itself the elements for regeneration; hence, such tissues suffer most by its ravages.

The stage of local probation may vary in different subjects, owing to modifying circumstances, the local inflammation gradually extending itself through the system, contaminating cell after cell, as it travels, until the more susceptible tissues are more or less completely saturated with the virus.

This saturation results in febrile reaction, of longer or shorter duration. After running its febrile course, it then subsides into the secondary, and, ultimately, the tertiary, or more thoroughly constitutional form, the more readily transmissible to offspring, and becomes a fixture, by producing certain modifications of cells, of different tissues, some more than others, which may, or may not, be entirely curable in every case.

To what extent the secondary form of the disease may modify a subsequent attack, has not been clearly defined yet, by authors. That the same subject may have repeated

attacks I am satisfied; though there is, at least in some cases, marked modifications of the disease, in subsequent attacks, by a species of *acclimation*, (if the term is allowable)—an immunity from severity, or, in some cases, altogether exempted, similar to other infectious or contagious diseases.

All the exanthematic forms of disease are, I believe, regarded as zymotic, or fermentative; of fermentative elements, in the fluids and solids of the body, consisting of the tertiary group of compound proximate principles; the azotized principles, constituting the elements of the ferment, or yeast, which plays a catalytic career only in the process. This fermentation, after pervading the whole organism, fluids and solids, capable of coming under this chemical influence, in opposition to vital resistance, destroys, more or less completely, the susceptibility of any similar process of the exact nature and origin of the first, notwithstanding the constant change of the entire organism, by constant waste and reproduction, this modifying influence being retained, more or less perfect, perhaps through life.

Syphilis, unlike any other of the zymotic tribe of diseases, has its acute stage, definite in its character; also a sub-acute stage, definite in character, following the acute, unless arrested by suitable treatment, by complete eradication. This sub-acute stage has limits, which probably subsides into the tertiary, or permanent constitutional variety, of the disease, becoming hereditary, or transmissible to offspring.

Each stage of the same disease is specific in character, and, if transmitted, that distinct form of the disease is transmitted only; if from the primary chancre, the three stages, in succession, may supervene; not so when the disease is transmitted from the secondary stage, by inoculation—the genuine primary chancre, and acute local and general symptoms are not developed, only the secondary variety; the third stage being transmissible alone by hereditary descent, from the best light and knowledge before us.

None of the other forms of zymotic exanthema ever become constitutional, and transmissible by hereditary descent.

None of them have any distinct secondary type, only a sequala of the acute stage, not even contagious during this stage, if so at all; the acute disease of the genuine type, alone, could be produced, excepting, as before stated, the modified form of variola, by vaccination, or varioloid.

Mr. Hutchinson, in the *London Hospital Reports*, vol. ii. p. 56, shows, from actual personal observation, that tertiary syphilis is transmissible by descent, after the parent had been apparently entirely cured for a number of years, and that such offspring frequently manifest such evidence, by their notched, grooved, and otherwise defective dental developments. In some instances given, the bones of the nose alone give evidence of the taint, by flattening, and want of development, on others, interstitial keratitis is observed, as a constitutional taint. Many other characteristic distinctives might be named, furthering these ideas.

Lancereaux and others maintain that constitutional or tertiary syphilis degenerates the man into something inferior, and no longer a man, having undergone a systemic change throughout.

Hunter, in 1786, first proved the specific nature of venereal disease, by inoculation, which was more recently confirmed by Ricord.

In 1813, Mr. Carmichael first treated these diseases without mercury, or the first to bring it to public notice; he used mercury when other treatment failed.

Prof. Gross, in his *Surgery*, says: "It is probable that the system, when once affected, nearly always retains the impress, so as to be transmissible from parent to offspring, during a series of generations." He further says: "The method of treatment has an important influence in etablishing a constitutional diathesis, especially mercury, in the first stage of chancre."

Parker, in his book on *Venereal*, says: "It is not capable of transmission by hereditary descent, but by inoculation of fœtus, at birth." And again: "Tertiary symptoms may make their appearance at long intervals, after the primary

have disappeared, or during the existence of the secondary, or even long after their subsidance, as patches on the skin, when the affection is of the tertiary form."

Sometimes this variety succeeds that of the chancre, without any affections of the skin or throat. This form may communicate, by contact, and produce the same form of disease, *per se.*

Ricord says: "When the chancre is cured in five days, no secondary symptoms follow." No recorded instance.

M. Cazenave, Erasmus Wilson, and Dr. Egan, have seen constitutional diseases without any chancre, only a discharge from urethra. They say inoculation does not produce constitutional disease in the same individual.

Waller, and Vidal de Cassis, have produced the disease in the healthy.

M. Boudeville, *Interne in Pharmacis*, says: "Inoculation produced the disease, in the secondary form, same as the patient from whom the matter was taken."

This author thinks that, when the father alone is affected, the secretions, coming in contact with the ovum, causes the taint, and not from physiological causes. Thinks it is, when the mother has secondary disease, in every instance.

In 153 cases, 46 had taken mercury for primary disease, and 76 none.—*Quin's Hospital Reports, Birmingham.*

Ricord's experiments show that malignant bubo, by inoculation, will produce the same sore.

Dr. Wallace, of Dublin, succeeded only three times in many hundred experiments.

Prof. Gross says: "Tertiary syphilis sometimes follows secondary, when this form has deeply penetrated the system, by gradual transition from one into the other, sometimes supervening in the course of five or six months, sometimes not until eighteen years have transpired; then coming on suddenly. In some cases no secondary symptoms supervene, the primary ending in the tertiary form. The matters from tertiary ulcers and sores are not inoculable, and not transmissible into specific form, though in some other constitutional manner."

In his *Surgery*, he seems to have paid no attention to hereditary or induced affections of children's teeth, not making any mention of the fact, of which we have abundant evidence in numerous cases cited.

The difference in specific characteristics of hereditary taints, and that contracted *in parturio*, must necessarily be considerable, in general symptoms, though perhaps similar in dental deformities, when such take place, varying chiefly in degree. Here is where we need more light on this important subject, so intimately connected with the welfare of so many unfortunates.

Syphilization, spoken of, is not of sufficient importance to require notice here, from the fact that it has not been, nor will it ever be, resorted to, except experimentally.

Prof. Gross further believes that secondary syphilis is not inoculable, or contagious, from the fact that the virus undergoes modifications after entering the system, notwithstanding the experiments of Vidal; Cazenave and others still believe it transmissible from parent to offspring, declaring itself in a great variety of affections; sometimes proving destructive to the new offspring before or after birth. He believes that when once affected, every globule of blood, and every particle of solid matter, is impressed by the poison.

The premonitory and culminating symptoms are well defined, followed by the surface culminations.

The blood, in the acute stage, does not show any change in corpuscles. In advanced cases, profound alterations take place in all the secretions of the body, as well as solids, in many constitutions.

Ricord thinks that tertiary syphilis is not hereditary, but that the offspring may be scrofulous or cancerous, and this may be owing to the bad condition of the blood, secretions, and tissues.

Microscopic Condition of the Blood in Secondary Syphilis.—"The corpuscles are smaller in quantity, irregular in shape, small in size, ragged edges, coalescing and adhering. In the advanced stage, the globules are converted into albumen."—*M. Grasse.*

M. Waller succeeded in inoculating with the blood of advanced cases; also MM. Diduy and Vidal de Cassis believe in its contagious nature.

Globules ot blood, after a few days, run together, and lose their form, on a glass slide, and show only a red stain.

The latest, and perhaps the most advanced views, on the subject of the disease, have been advanced by Lionel S. Beale. Under the head of *Diseased Germs*, he says: "This is another of those remarkable special living poisons, which may be suspended in serum and other fluids, and retain its vitality for any length of time."

There is reason for thinking that a single epithelial cell may carry multitudes of active particles of syphilitic poison, one of which, introduced in the blood or lymph of a healthy person, would probably grow, and multiply, and give rise to pathological changes, characteristic of, and quite peculiar to, this particular poison.

Again Dr. Beale says: "We know that syphilitic poison may retain its specific characteristics in the organism for years, from time to time giving rise to local pathological phenomena, which are characteristic of this kind of morbid bioplasm."

It is impossible, from the facts of the case, to arrive at any other conclusion than this, that a certain portion of the living matter remains in the organism, and that under certain favorable circumstances, this grows, and multiplies, producing disease. Particles of this virulent poison may be transferred from the affected organism to a healthy one, and contaminate it, even many years after its introduction into the first had taken place.

Of syphilitic bioplasm there are different kinds, giving rise to different pathological affections belonging to the syphilitic class. Indeed, some facts render it probable that there are several different species, or varieties, of syphilitic poison, instead of only one or two.

One very remarkable property of this poison is, that it may be inoculated into the same organism over and over

again, until inoculation ceases to produce any effect. As soon as this is the case, it is said the organism is protected. But such protection, sometimes, cannot be produced, until successive inoculation has been practiced during several months, and, as has been remarked, the remedy is worse than the acquired disease, besides being, on many grounds, quite unjustifiable.

To be Continued.

ARTICLE IV.

Mixtures of Ether and Chloroform—The Vienna Mixture.

About two years after the introduction of Chloroform, a mixture of ether and chloroform began to be employed. We do not know who first introduced this compound. We ourselves were using it in 1850; but whether independently or in the track of some other experimentalist, we cannot at this moment recall. The proportions of ether and chloroform advocated at first were equal parts by measure, and the mixture was inhaled from a sponge or from Snow's inhaler. From the outset, Snow, who during his life was properly accepted as the best experimentalist and practitioner in the department of anæsthesia, was opposed to the mixture of ether and chloroform. His opposition was based on very sensible reasons. Ether, he said, is about six times as volatile as chloroform—that is to say, if equal measure of each be placed in two evaporating dishes, kept side by side, at the same temperature, the ether evaporates in about one-sixth the time of the chloroform; and when the two liquids are mixed, although they then evaporate together, the ether is converted into vapor much more rapidly. In whatever proportions they are combined, he argued further, before the whole is evaporated, the last portion of the liquid is nearly all chloroform. The consequence of this, he continued, is that at the commencement of the inhalation the

vapor inspired is chiefly ether, and towards the end nearly all is chloroform, the patient experiencing the stronger pungency of ether when it is most objectionable, and inhaling the more powerful vapor at the conclusion, when there is most need to continue cautiously.

It is worthy of observation, in parenthesis, that the above admonition given by Snow, in the same sense if not in the same words, twenty years ago, and repeated by him in the words we have quoted in 1858, has been independently restated by Mr. Spencer Wells in the present year. Speaking of the employment of the mixture of ether and chloroform in cases of ovarian operation, Mr. Wells says: "I tried a mixture of chloroform and ether in various proportions, but soon became aware that the patient was at fiast only affected by the lighter vapor of ether, and was then subjected to the action of the chloroform just as she was least able to bear it."

The criticism passed upon the mixture of chloroform and ether at first by Snow, though itself exceedingly correct, would possibly have carried but little weight had distinct success attended the practice, and had any definite proportion of the two fluids been decided upon by competent authority. A mixture called the Vienna mixture, containing six parts of ether to two of chloroform, was of definite strength; but the mixture in our own hands and in the hands of other administrators proved uncertain, and therefore lost ground. We administered in one case of removal of the lower jaw, in two cases of ovariotomy, in one case of amputation of the leg, and in various minor operations. Report of its use from the continent was favorable; it was used it was said, in Vienna eight thousand times without a casualty.

Notwithstanding many facts in support of the Vienna mixture or chloroform and ether, we are forced to admit that it is not a perfect anæsthetic. It has the vice Snow predicted of it—it is irregular in its action. It is slow in action; for, indeed, the narcotism immediately induced is from the ether,

not from the chloroform, while the action of the chloroform becomes manifest later on, and in a manner most disagreeable both to the administrator and to the operator.

When we give chloroform simply, we induce a first stage or degree of narcotism, and then a second stage or degree, with some excitement, and it may be with convulsions, tetanic rigidity, retching or vomiting. During these stages the surgeon does nothing; but there succeeds a third stage —one of quietude—during which the operation is commenced, and if extreme muscular relaxation be not needed, is completed. Here all is clear practice—a direct course for an unimpeded operative procedure when once the anæsthesia has reached the proper degree.

When ether is administered simply, there is often resistance in the early stage of narcotism, then, sometimes, convulsive movement, with undue filling of the veins, overaction of arteries, flushing of the face and occasional vomiting. This stage is followed by a stage of comparative quietude, during which the operator performs his painless task.

We have drawn these stages in bold outline for the sake of giving a clear definition of the process of anæsthesia as induced by the two agents under consideration. In some instances the different stages are only imperfectly delineated, the patient passing from the first to the third degree of narcotism almost imperceptibly: but the rule is for a series of stages more or less marked and more or less prolonged.

In administering a mixture of chloroform and ether this order of degrees or stages is broken, broken for the precise reason stated by Snow—viz., the unequal volatilization and diffusion of the two substances. Thus the first and second stages of narcotism by the ether may be developed, and a third stage follow, during which the surgeon commences his operation; but as he proceeds the action of the chloroform may begin to be felt, and rigidity of muscle, or retching or vomiting, may complicate and delay his proceedings. We observed these difficulties so often that we gave up the use

of ether and chloroform mixture, although no fatal accident, and we believe no special indication of danger, ever resulted from it in our hands.

It was stated in a previous paragraph that in Vienna the mixture of chloroform and ether had not, during a long experience, been attended with fatal results. It must not thereupon be inferred that no death has followed such administration. The *American Journal of the Medical Sciences* furnishes the record of a death in July, 1857. Dr. Crockett, of Wytheville, in Virginia, was about to operate on a boy five years old, to remove a tumor from the back. In order to induce anæsthesia, chloroform and ether were administered in combination, in the proportion of one part of chloroform to four of ether, the parts being determined by fluid measure. This actually was the Vienna mixture. One fluid drachm of the mixture was poured on a funel-shaped sponge, and the administration was continued by Dr. Crockett until anæsthesia was complete. The sponge was then given to Dr. Kincannon, the family physician, who sustained the narcotism, and carefully watched the pulse. As soon as the patient was insensible the operation was commenced, and was very quickly completed. Whilst Dr. Crockett's son was sponging the wound, and waiting to see if any more arteries (beyond those that had been tied) would spring, the little boy began to vomit and became pulseless. He ejected a small portion of the contents of the stomach. He was immediately placed in the prone position, the tongue was examined to see that it had not fallen forward, and the Marshall Hall method of artificial respiration was thoroughly carried out, but without avail. The patient died within three minutes after the commencement of the vomiting. Dr. Crockett remarks on this case that there was nothing whatever to account for the fatal action of the anæsthesia. The last artery that was tied yielded bright arterial blood, showing there was no asphyxia; and anæsthesia was never carried so far as to produce stertor, while the circulation and respiration continued perfect up to the moment of the vomiting.

It is a curious circumstance that Snow, who has commented on this case, attributed the death to loss of blood. Dr. Crockett says the loss of blood was probably four ounces, certainly not six—a loss altogether insufficient to account for death from hemorrhage. Moreover, the symptoms were not those of death from hæmorrhage, but were definitely those that mark one form of death from chloroform. In plain truth, the case is typical, in an extreme degree, of the influence of chloroform upon a subject already under the influence of ether, and Snow's original observation as to the danger of using a mixture of two substances having different boiling points and different rates of diffusion of vapor, explains the cause of death faithfully. It is because the case stands out as a striking illustration of the nature of the special danger attending the use of ether and chloroform in mixture, that we have introduced it so prominently in this place.—*London Lancet.*

ARTICLE V.

Effect of Nitrous Oxide Gas.

In consequence of two or three deaths recently from the influences of nitrous oxide gas, an active discussion has been going on in France and England upon the subject, and various persons have been giving their experiences. One gentleman, a licentiate in dental surgery, thus narrates the effect of inhalation had upon him. The account is taken from the *British Journal of Dental Science.* He says:—

"I had to undergo a painful operation. I wished to take the nitrous oxide gas. I had administered it a great number of times, and in hearing the incoherent way in which patients expressed themselves as to the sensation whilst passing into an anæsthetic state, I hoped I might be able to define somewhat the effects of the gas. I say I hoped to be able, for of course, it is impossible to say what may be the effect of such an action upon any individual until we

have experienced it, as I have no doubt different persons are differently affected, and the gas is so interesting and important to us that everything concerning it is worthy of notice.

I was well attended. Two Fellows of the Royal College of Surgeons and the anæsthetist—all were standing behind me, so that I could only see the face of the anæsthetist as he leaned over my shoulder with the mouthpiece; the other two were quite hidden from me. I am quite sure of that; I was perfectly composed, and as soon as the pipe was put to my face I formed a resolution steadily to take in the gas. My eyes were open and I looked at the distant wall. I heard them say, 'He takes in the gas freely,' which were the last words I heard distinctly; then I felt my eyes droop and close. Now I seemed to be in a different atmosphere, just as we feel in passing into a tropical house at Kew Gardens—different, but not an unpleasant atmosphere. As to choking we hear so much about, or soffocation, I felt not even the least repugnance. The only effect was, I remember thinking to myself this is another atmosphere; it seemed sweet and sooty; at the same time my ears were filled with a burring sound, such as I suppose is felt in descending the diving-bell, but not so violent. Immediately there danced before me a violent light the size of a large candle, and with a strange unearthly motion it flickered, rising up higher and higher, and I seemed to be strangely upborne with it. Up, up we went to a very high altitude, the burring sound always present. At last the light stood still, the burring ceased, and my attention was simply fixed on the light. It seemed an immense height we had come. To this stage I seemed to be a nonentity all my care had been devoted to the sound in my ears and the movement of the light; all the unpleasantuess of the atmosphere had passed away. Now, however, a change came over me; became a person—a some one—and I felt as though I could see from every part of me—a sort of cataleptic state; and just as in looking over the cliff at Beechy Head on a calm day you hear conversation on the sea below, though you cannot discern the men in the

skiff, so now in a strange muttering undertone I heard a voice as though explaining something about *me* to others. I was sure there were others present, and though explaining something I did not know a single word of what was said, and gradually there crept over me the conviction that I was bound helplessly, and they were doing something to me. There was a dead calm; the mutter ceased; I could see them looking intently with heads inclined. Simultaneously they raised their heads and the voice again spoke, but I had no pain, nor had I any pain or feeling when the gash was made; indeed (though I was cut in two places) not even the slightest prick; still I knew when the tumor was punctured. Although it was awfully tender to the slightest touch in my normal state, I had not the slightest pain until the tumor was violently pressed to force all the blood out; then I was conscious of painful sensation, and I groaned, as I thought, on account of the severity of the pain from squeezing. I felt whatever they were doing to me was now done, and done successfully, and I wanted to express my thankfulness, but I found myself unable to move or speak. Now the burring commenced, and the light, which had hung all the time shining over my head, began to descend, and I with it, and gradually the talking became nearer and more audible, the light went out, and the burring sound died away in the distane, and my eyes opened and with a heart full of gratitude I stretched out my hand to the gentleman and cried out lustily—'Thank God! thank God!' To which they replied—'It is all right; it is nicely done.' I rejoined—'I know it is. I know all about it.'

"I asked if I had made any groaning when the pressure was applied, and I was surprised to hear that I was not only silent but also motionless all the time. I took four gallons of gas, and from putting on the facepiece to my regaining consciousness was seventy seconds.

"I was not conscious of any sensation or nausea or giddiness, but a decided consciousness of disturbance, sensation of pricking about the cardiac region, and great pain in the

tibiae, like a severe rheumatic pain, which increased, and though in bed, it settled into a dead coldness and want of circulation, which was not removed till I took two stiff glasses of stimulants; since that I have had no inconvenience."
Druggist's Circular.

ARTICLE VI.

Amputation of Part of the Tongue for Carcinomatous Disease.

Upon looking at this patient, (thirty-eight years of age,) you see at a glance that he is a sick man; his face is sallow and his frame is emaciated. He states that since he first began to be sick, nine months ago, he has lost over forty pounds in weight. The quantity of urine voided is normal in quantity and quality. His bowels are open, he has no flatulence, indigestion nor unusual thirst; his appetite is good, but he cannot eat; his hands and feet are warm; he never had intermittent fever or night-sweats, but he has a trouble of his tongue, which commenced four weeks ago, in which he experiences constant burning; at times lancinating pain, which seriously interferes with mastication and deglutition. As he protrudes the tongue, you notice a surface continuously ulcerated, principally on the left side of the median line, extending from the tip a considerable distance back. I can find no enlarged lymphatic glands under the jaw. His diet is necessarily confined to the blandest articles, and such as require no mastication—such as milk, beef-tea and milk punch. His face is not pallid or livid exactly, but has a sallow, cadaverous appearance peculiar to the cancerous cachexia.

This may be either of two affections—syphilis or epithelioma. A man may have a chancre on his lip or tongue by inoculation from a mucous patch, or directly from virus accidentally carried by the finger, or an ulcer may exist here as the result of constitutional syphilis. In such a case

however, the ulcers have well-defined edges, generally with a foul, irregular base, and are not single, but appear in scattered patches; they are not confined to the tongue usually, but co-exist on the fauces, uvula and pharynx. There would also be evidences of specific disease in other portions of the body, and a distinct history of inoculation, neither of which exists in the present case.

Therefore, by exclusion, and from the appearance, hardness, and peculiar pain, I would consider this epithelial cancer, or cancroid, as it was termed by Prof. Miller, of Edinburgh; or, properly, scirrhus, modified by the structure involved. This generally comes without assignable cause. It has been attributed to smoking a short pipe, with the hot stem constantly against the tongue; but this is unsustainable by proof; the disease in some cases occurring in patients who never smoked, while thousands of others escape who are inveterate smokers. Encephaloid disease of the tongue is extremely rare, while colloid and melanosis in this situation are unknown. This disease is most common after the age of fifty, and in the male sex. It commences as a little sore, papule, or crevice in the tongue; it then gradually spreads and ulcerates, and is the seat of the characteristic pain, which is generally worse at night. The surrounding part is hard, from infiltration of plastic lymph and cancer cells, and the organ can no longer be used in mastication on account of its stiffness and the pain produced by moving it. The disease finally extends to the gums, the teeth fall out, the submaxillary glands enlarge, and the system sinks under the exhaustion from the cachexia which becomes established, and from impaired nutrition. The fatal result generally supervenes within a year or eighteen months from the onset of the disease.

The only operation likely to afford any relief would be excision of the affected part, not in the hope of cure, but to palliate the symptoms. But he is not in a condition to bear such interference at present; his general health must first be improved by relieving his pain and allowing him to

sleep, by giving him gr. xxx. of chloral at night. He shall have plenty of soft, nourishing food, such as milk-punch, animal broths, soft boiled eggs, etc., with daily open air exercise, and may wash his mouth frequently with dilute solution of permanganate of potassa. It is important that the patient should not swallow the secretions, as pyæmia might result. I have seen this occur in two cases—in one after removal of a polypus, and in the other from plugging the posterior nares.

November 20, (one month later.)—The patient's health is much improved, and he returns for operation. The ulcer is now rapidly spreading beyond the median line of the tongue, and also on the under surface. Ablation, or excision of the tongue, is not required in this case; removal of the offending part is all that will be attempted. This should not be done with the knife, as there would be severe, perhaps uncontrollable, hemorrhage from the vessels, which are abnormally increased by the disease. This is one of the operations to which the ecraseur is eminently applicable, as it crushes and lacerates the vessels, producing rapid coagulation of the blood and diminishing hemorrhage. Before applying the chain of the instrument, the tongue is transfixed by three stout steel pins at the line where you wish to amputate. The ecraseur is then applied and the diseased mass removed. The lingual artery and a few small vessels required the ligature; the capillary oozing was checked by ice. The operation was performed without an anæsthetic, at the patient's request. An anodyne will be given immediately, and the former treatment continued, to which shall be added quinine and iron.

[The patient was subsequently shown at the clinic, and reported himself as being much more comfortable. He made a good recovery from the operation, and there was no secondary hemorrhage. He was then able to speak so as to be understood, although half of the anterior portion of the tongue had been removed transversely. He afterwards complained of a severe sore throat, and within two months

from the operation, died from debility. No examination could be obtained.]—*Surg. Clinic of Prof. Gross.—Medical Times.*

ARTICLE VII.

Effects of Alcoholism upon the Nervous System.

A few months since we called the attention of our readers to the demonstrated facts concerning the physiological action of alcohol. We wish now to give some of the effects that its continuous use produces in the nervous system. It must be remembered that this system is composed essentially of nerve cells, nerve fibres, blood vessels, connective tissue and unceasing membranes. The nerve cells and nerve fibres perform the work of the nervous system, the other elements merely protect and nourish these. Now what effect has the use of alcohol upon these anatomical elements?

In answering this question we cannot do better than to give the statements of Dr. Austin, as published in the *Lancet* for February, 1873:

In the brain of old drinkers there is found a general shrinking of the cerebral mass, a flattening of the convolutions, and the arachnoid space. Microscopic sections show that the same atrophy extends to the individual nervous elements of the centers, while the connective tissue is everywhere thickened. Besides the development of fibroid connective tissue there is much granular fat, representing the the destruction of the nervous elements. True inflamations are seen in dura mater in the neighborhood of the longitudinal sinus, and of the pia mater at various points along the line of the vessels. In cases of drink of any standing, the smaller arteries and capillaries are markedly affected with atheroma. In many cases the sheathing membrane is distended with the remnants of effused blood, and its external surface surrounded with heaps of minute oil globules. Moreover at particular points in the course of a vessel, the surrounding nervous tissues are dotted with punctform hem-

orrhages. To sum up: The unvarying effect of continuous impregnation of the blood supplied to the brain, with considerable per centages of alcohol, are degenerated and atrophy of the vessels, thickening of the connective tissue elements, and in the smaller number of cases inflammation of the membranes, which in the case of dura mater tends to be limited in extent, but in that of the pia mater may be diffused over a considerable surface; but in all cases there is a conspicuous atrophy of the true nervous elements, more especially of the vesicular matter.

In short, alcohol destroys the nerve cells and fibres, disables or destroys the vessels which supply the blood to nourish the parts, and cause an increase of connective tissue. No wonder that there is a perversion of the mental function when the organs through which they alone can work are thus crippled.—*Detroit Review of Medicine.*

ARTICLE VIII.

Surgery.

On the Removal of Tumors from Bone—The object of this short but valuable paper (Sir James Paget in the *Medico-Chirurgical Transaction*, Vol. L I V, London, 1871,) is to formularize and recommend a mode of treatment, which though it has been occasionally resorted to in individual cases, has never been recognized as an established rule of practice. The mode of treatment in question is the enuclea tion, or simple extirpation, of nonmalignant tumors growing in bone, rather than their removal by the more sweeping operations of resection or amputation. Six cases are detailed to show the feasibility and advantage of thus dealing with cartilaginous, bony, fibrous and myeloid tumors growing in bone; and the paper ends with certain suggestions as to diagnosis, which appear to us so valuable that we quote them in full for the benefit of our readers:

"For cancerous and recurrent tumors, amputation or

resection is generally advisable; for innocent tumors growing on bones, excision; for innocent tumors growing in bones, enucleation.

"1. The tumor is probably cancerous if its growth commenced before puberty, or after middle age, unless it be a cartilaginous or bony tumor on a finger or toe, or near an articulation.

"2. If a tumor has existed on or in a bone for two or more years, and is still of doubtful nature, it is probably not cancerous or recurrent, and this probability increases with the increasing duration of the tumor.

"3. If a tumor on or in a bone has doubled or more than doubled its size in six months, and is not inflamed, it is probably cancerous or recurrent, and this probability is increased if among the usual coincidences of rapid growth, the veins over the tumor have much enlarged, or the tumor have protruded far through ulcerated openings, and bleeds and profusely discharges ichor.

"4. If with any such tumor, not being inflamed, the lymphatics near it are enlarged, is probably cancerous, and still more probably if the patient have lost weight and strength to amounts more porportionate to the damage of health by pain, or fever, or other accident of the tumor.

"5. A tumor on the shaft of any bone but a phalanx is rarely innocent, and so are any but cartilaginous outgrowths on the pelvis, or any but the hard, bony tumors on the bones of the skull.

"When the wall of the bone can be traced over the surface, or any part of the surface, or the tumor, its growth from within is almost certain. And so it is when, on the surface of the tumor, portions of bone can be felt among portions of more yielding substance. General smoothness of surface is usually significant of a tumor growing with a bone and expanding it, unless in the case of cartilginous tumors, which, after growing within bones, have been protruded through some parts of their expanded walls. Pulsation in a non-cancerous tumor connected with bone is a

nearly certain sign of growth within bone, except in the cases of certain specimens of myeloid epulis; and, when such pulsation is felt, it is no indication that severe bleeding will ensue in the removal of the tumor, for it is only derived from the arteries on the walls of the bone cavity lodging the tumor."—*American Journal Medical Sciences.*

ARTICLE IX.

Testimony in favor of Dr Arthur's Method.

BY THEODORE F. CHUPEIN, D D. S.

During the late war between the States I was sent for by the General commanding the troops, where my company was stationed and doing garrison duty, to render him the service of filling a tooth. I had never thought of taking my dental instruments into camp, but after this request from the General, (which gave me a short furlough, a respite all soldiers were glad to obtain,) to have me operate for him, I kept my instrument case in camp, and operated to a considerable extent for the officers and men in the various companies and regiments stationed around.

The question of filling teeth with gold foil was one of no little pecuniary outlay, even in "Confederate money," for at the time at which I write I paid "*twelve hundred dollars* for *an ounce of gold foil*," bought at Atlanta, Georgia. I was therefore constrained to use tin foil to a considerable extent, and even when this got low and was giving out, to use the chisel and the file, the latter being very often so dull from continual use, notwithstanding frequent sharpenings with the aid of sulphuric acid, that considerable time and torture was used to effect the operation. All cases therefore, of superficial decay, wherever situated, were consigned to the tender mercies of the file and chisel; for men were ever then on the move, and "*we could not wait for cavities to get larger.*" Being in an artillery company I had the advantage of the portable forge, wherein I could renew my

tools. This, at least, kept my chisels in order, it lent me no aid with my files. I have within the last month seen cases I had treated *nine years ago*, of superficial caries removed on the buccal and masticating surfaces of the molars with the chisel, and on the proximate surfaces of other teeth with the file, in the most perfect state of preservation, looking as white and as beautiful as if they had never been touched by decay.

I had always been taught in operating on the front upper teeth first to seperate them, and, when well separated, to start the file well under, so as to remove a good portion of the palatine and proximate surface, thus securing a self-cleansing space when the teeth came together again. All the teeth that I treated in this way, in the army, which have come under my observation, exhibit a perfect freedom from decay. I do not know if I can call this "testimony in favor of Dr. Arthur's method," for as *I* understand, his consists of the use of the chisel alone on the proximate surfaces of all the teeth, so as to secure self-cleansing space; but if the operation be performed with a chisel or file, and the result be the same, the testimony as to the efficiency of such separations holds good.—*Dental Times.*

ARTICLE X.

On the Treatment of Fracture of the Inferior Maxilla.

BY D. R. SILVER, M. D., OF SIDNEY, OHIO.

Fractures of the inferior maxilla are notoriously difficult to treat. This is true, simply because the obvious indication, namely, to keep the fragments in accurate coaptation for a sufficient time for union to take place, is difficult to accomplish. Difficulties exist in the very nature of the office performed by this bone. To take solid food, to swallow liquids, even the saliva; to talk, to cough, or to expectorate, requires in it mobility, unless there be a fixed point of support for it. This support is furnished by the superior maxilla, and, therefore, in the treatment of such fractures the patient is

directed to *keep his mouth closed*, a direction wholly superfluous (if the incisors, or some one of them, have not been lost,) because it cannot be accomplished. To such a strait have surgeons been driven, in order to keep the jaw fixed, that food has been introduced through the nares, or through the aperture made by the removal of a sound tooth. Should these measures not be taken, the patient suffers emaciation for want of proper food, or union is delayed by frequent movement of the fragments. All surgeons are aware of the various methods adopted in these troublesome cases. But, so far as I know, none have used and reported that which I devised and found eminently efficient and satisfactory in the following cases:—

Mr. D., aged 30, a laborer, while felling a tree, was struck on the *right* side of the face by a piece of wood, fracturing the inferior maxilla on the *left* side, at a point corresponding with the first molar tooth.

Four weeks after the accident patient presented himself to me for treatment. Examination revealed a transverse fracture at the point before specified, fragments freely moveable, crepitation distinct, first molar very loose and carious, pus exuding from a small abscess in the gum at the point of injury, first and second upper molars on the same side lost. Patient has a severe cough, otherwise in good health. Owing to his cough, and the fact that his front teeth, upper and lower, are perfect and in apposition, necessitating movement of the jaw to swallow even liquids, the usual treatment for four weeks had wholly failed.

Under the circumstances, I adopted the following expedient. A competent dentist drew the carious tooth, and was then directed to take an impression of patient's mouth as for artificial upper teeth, the soft wax taking the impression of the upper molars *on both sides*, and spaces where no teeth existed; the lower jaw was now also closed upon the wax until the incisors approached; leaving a space between of barely half an inch, the fracture at the same time being accurately adjusted. The wax being removed, side-pieces were moulded upon it to fit the gums as splints, at the

point of fracture A cast was now taken in vulcanized rubber, which answered every indication. We had therefore a *perfect* splint. Placed in the mouth, the jaw secured by a piece of adhesive plaster, the mobile member was found to be alnost immovable, yet the patient could eat, drink, talk, cough and expectorate with comparative comfort. After twenty days union was sufficiently perfect to permit removal of the splint.

The advantage secured by this arrangement are sufficiently obvious, but not the least was this; that *lateral* movement was prevented while the patient slept, and support given to *both* sides of the jaw, securing great comfort to the patient and rapid union of the divided bone.—*Med. & Surg. Reporter.*

ARTICLE XI.

New Method of Treating Ulcers.

Dr. Philip Cowen, makes some interesting suggestions with reference to the treatment of ulcers. He regards an ulcer as a local asthenia of the skin and parts beneath, a local weakness and loss of plasticity, a brittleness where softness, elasticity and pliancy, yet strength, should exist, a local tendency to degeneration and death. Knowing that an ulcer has power of absorbing matters applied to its surface, he availed himself of this property by applying, locally, matters having nutritive powers, so that the skin might be nourished locally at the weakened and degenerate spots, by taking up such matters as would nourish its weakness, and convert its brittleness into a plastic and healing state. To apply this theory he made a paste of the following substances: Flour, four ounces; powder of acacia, one ounce; chalk, two drachms; cold water, one pint. These were boiled gently for a minute, and then allowed to cool. It then was thinned, by the addition of water, till it could be readily spread over the ulcer by means of a brush. The application was made three or four times daily, care being taken to keep the paste perfectly fresh and sweet.

Seventeen cases are reported, in which more or less rapid healing took place. These all occurred in a work house, under anything but favorable conditions. The Dr. observes:

1. That islands of skin arise in some cases in the center of the ulcer as well as from the circumference.

2. For some days after applying the paste there is a large increase in the ulcer secretion, but it soon becomes normal.

3. The remedy is painless.

4. The cicatrix is peculiarly healthy and strong in appearance.—*Lancet. Review of Med. & Pharmacy.*

ARTICLE XII.

Electricity as a Means of Resuscitation.

Allan McLane Hamilton, M. D., New York, in a paper on this subject (*American Practitioner,*) speaks of the following results arrived at from his own practice and experiments:

1. That it is useless to expect good results if five minutes have elapsed since life appears extinct.

2. That the current should be applied faithfully and steadily, one pole being placed on the ensiform cartilage, the other on the base of the skull, or over the track of the great nerves of the neck.

3. That the faradic and interrupted galvanic currents are the best.

4. That the current should be applied some time after perspiratory movements have become regular.

In conclusion the author says:

"The necessity of having a battery within reach is apparent. Every practitioner should have a small one for emergencies. They should be kept at each life-saving station on the coast, ready charged, with directions for immediate use. If this were done, he doubts if the per centage of deaths would be so great as it now is. Artificial respi-

ration by the production of muscular movements is a very valuable means of restoration; but a force that acts directly upon the nerves supplying the muscles of respiration, is by far the surest and best."—*Medical Examiner.*

ARTICLE XIII.

A New Specific for Rheumatism.

Rheumatism, notwithstanding that it is one of the most obstinate diseases, some forms of which baffle the skill of the most eminent physicians, is, from a medical point of view, highly interesting; the late Dr. Valentine Mott used even to say that "it is one of the beauties of rheumatism that it shows itself in such a great variety of forms." It is a fact well known among the medical profession that many rheumatic patients, in the impatience produced by their affliction, change from one physician to another; at length the disease has run its course, the patient gets well, and the last doctor whom they then happen to have, earns the credit of the cure.

Without intending to trespass on the domain of the physician, it may be well to give, for the benefit of all, some information concerning the nature and treatment of this malady.

As it is a constitutional disease, proper diet and close attention to the general health are of more benefit than local applications, which may be useful in exceptional cases, but generally they give only temporary relief, and often drive the pain from one part of the body to another. In all cases of this disease, the blood is in an abnormal condition, and may be considered to be poisoned; persons who live high (which means, live on rich and highly nitrogenized food) are apt to have this disease in a peculiar form, which is commonly called gout, of which the chief seat is in the joints. A lower mode of diet is then advisable. Persons who live low and get this disease by exposure, combined with over fatigue, are apt to suffer from the so called chronic

form chiefly seated in the muscles, and in these cases, the system may suffer from one or two opposite causes, an excess of either alkali or acid, which, when neutralized, ends the disease. Hence the curious and formely unexplained fact that sometimes acid treatment, as with lemon juice, and at other times alkaline treatment, as with Rochelle Salts, etc., has produced a cure.

There is one very severe form of rheumatism called acute or inflammatory, which is a most formidable disease, and which in olden times was treated by blood letting. This disease has the remarkable feature of suddenly leaving one part of the body to appear in another. If, by blood letting, the heart receives a sudden shock by the withdrawal of a quantity of blood, the malady is very apt to settle there and produce disease of the heart, which is a very common cause of death among persons who once have been treated for rheumatism by blood letting. The latter operation relieves the patient; but, considering the often fatal results, it is now abandoned by all enlightened physicians, and the treatment by colchicum wine and opiates is used instead. Besides the derivatives of opium, morphine and codeine, (see page 273 of our current volume), sal ammoniac has been often praised as an effective remedy when others failed; but perhaps these derive their efficiency from their similarity to a new substance, a derivative of opium and ammonia, which has recently been found as effective a specific against rheumatism as quinine is against fever and ague. This substance is propylamin. It is a volatile, watery liquid, with a strong odor of herring pickle, and was found by Dr. Winckler in distilling a watery extract of ergot with potassa, also in distilling cod liver oil with ammonia. But the most effective way of obtaining this substance is that of Werthein, who prepared it by the decomposition of narcotine and codeine by alkalies. Its name is based on its chemical composition; it is a combination of the third member of the hydrocarbon series (methyl, ethyl, propyl, amyl, etc.) with a derivative of the ammonia (amidogen, mentioned on pages

20 and 144 of our current volume.) There is, however, still some doubt about its true chemical composition, so that some chemists suppose it to be trimethylamin; in the mean time, its specific effect on most forms of rheumatism has been established. By taking five drops in a tablespoonful of peppermint water every two hours, the pains usually abate after twelve doses.—*Scientific American.*

EDITORIAL, ETC.

A Cause of Facial Neuralgia.—Dr. Joseph H. Scales, of Newburn, Va., writes as follows:

"Enclosed you will find a tooth I extracted about three weeks ago for a lady. It is a *third lower molar*, and as you see, has five well defined roots, three of them ordinary size; though the posterior one, which entered the ramus of the jaw almost at right angles, was broken, leaving a portion of it. The person for whom I removed it, had been suffering the most excruciating agony from facial neuralgia for several months, and in the hands of a skilful physician, all the known remedies had been exhausted on her, without affording any relief. She was compelled to keep under the influence of opiates to get any rest at all. I determined to remove it, though the lady assured me that it had never ached, nor had it ever been even sensitive: while it is considerably decayed, the nerve is not exposed. The filling in the grinding surface was put in about three years ago, and it has never been any trouble since.

Since removing the tooth the neuralgia has left her entirely, and her general health is improving rapidly

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Removal of Cystic Tumors from the Eyelids.—Professor J. J. Chisholm, M. D., of Baltimore, gives the following simple method of removing these tumors, which is published in the *Canada Medical Journal:*

"It is a modification in the use of the nitrate of silver that Dr. Chisholm has found so effective in the treatment of sebaceous cysts of the lid, and which has enabled him to discard for many years, the tedious, painful, and sometimes dangerous cutting out of such tumors. If the tumor be a sebaceous cyst, located between the upper portion of the tarsal cartilage and the skin, a Dessmarre's ring forceps is used as a clamp upon the lid, to shield the ball of the eye from injury, to fix the tumor, and to

prevent annoying oozing of the blood. Under this ring pressure a small opening is made into the cyst, through which its contents are squeezed out. The end of a small silver probe, dipped in nitric acid, is then passed into the cavity, is made to pass over the epithelial lining surface, and is withdrawn. Usually, in its passage into the cavity of the tumor, it cauterizes sufficiently the lips of the incision to prevent any oozing of blood when the clamp forceps is removed. When the cyst is formed by the closure of a Meibomian duct, the better plan is to evert the lid and make the puncture from the conjunctival surface, the caustic being applied as directed. The advantage gained by this modification is in the more certain, thorough, and yet restricted application of the caustic, confining its cauterizing influences only to those portions in which action is desired. The results are in every case satisfactory. No after-treatment is needed.

Colorless Tincture of Iodine.—The greatest objection to the officinal tincture of iodine so useful in alveolar periostetis, as to be regarded by some practitioners as a specific, is the discoloration it causes when externally applied. The *Medical & Surgical Reporter* gives a formula for a colorless tincture of iodine, which is said to be convenient and efficacious. It as follows:

℞. Tincture of iodine,
Pure glycerine, aa ℥j.
Sulphite of Soda, ʒj.

Rub the salt to a powder in a small mortar, and add the glycerine gradually; then pour in the tincture of iodine, and triturate gently until a solution is effected, and the mixture assumes an amber color. It is asserted that the properties of iodine are increased by the addition of the sulphite of soda, and that the glycerine enhances the value and convenience of the preparation for local application.

The Southern Dental Association.—The fifth annual meeting of this association will be held in Baltimore, commencing on the last Tuesday in July next. This promises to be one of the most interesting meetings ever held, and we trust it will be well attended by the Southern members of the profession. Efforts are

now being made to obtain reduced fare on all railroads in connection with the Baltimore and Ohio, due notice of which will be given.

American Dental Convention.—The nineteenth annual meeting will be held on the 12th, (second Tuesday) in August next, at Saratoga Springs, New York. Dr. C. S. Hurbut is the Secretary of this association, and will publish an order of business in the next number of *Journal.*

MONTHLY SUMMARY.

Brain Stimulants.—A prominent clergyman in a neighboring city writes us, that for many years he has been in the habit of limiting his use of tea and coffee, and his "occasional cigar" to the latter part of the week, and as he fancies, with the result of being able to compose with less effort than when he has either abstained entirely from their use, or when, as once or twice, he has indulged in them continuously for a brief period.

Herein is a valuable suggestion to brain workers in any profession, the exigencies of which call for occasionally increased and severe efforts. Tea, coffee, tobacco and alcohol, by retarding the changes in the tissues of the body, which is their physiological action, are supposed to allow the energy thus conserved to manifest itself in the higher form of cerebral activity—in simpler language, they are stimulants to the nervous system; and, in the proper dose, there can be no question that they do exalt and stimulate brain-action. But there is equally no question that the retarded tissue changes are at the expense of vitality generally—the vitality of the body; that is, its health and strength, being ever in relation to the newness of the atoms which compose the body—and these tissue-changes, the work of waste and repair, must be accelerated in some manner, and to a corresponding extent, in order to preserve the balance.

The obvious lesson to be gained from these facts is, that during periods of intense and unusual mental activity, a lawyer in trying

an engrossing case, a banker during a financial stress, a company officer at periods of increased responsibility, an editor or political leader carrying through an important measure—that at such times brain-work may be done with more facility and at less expense, by a judicious use of this class of agents,—provided that the balance be struck at once when the necessity for them is obviated.

The means of restoring the balance include first, abstinence from the agents themselves; second, comparative rest for the brain; and lastly, and quite as importantly as the preceding, those measures which accelerate tissue-changes, and of which the essential ones are physical exercise and bathing—notably the Turkish bath—and nutritious, easily assimilated food, by the first of which, the breaking down of the older particles, and the excretion of poisonous waste-matter are facilitated, and so tissue-change in the interest of waste is promoted, while the last furnishes material for renewal and growth.

With such a regimen, based on an intelligent application of means to ends, we would have fewer cases of men prematurely breaking down under efforts they might make with ease, did they only know when and how to open the throttle-valve, or to put on the brakes. This view of the subject must not be construed into an argument for a mere sensual indulgence. It is intended for men as they are, and with regard to conditions as they exist. These agents are used, and probably always will be. They have their uses; and knowledge of these will do more to prevent than the wholesale condemnation which frequently arises from ignorance.—*Hygiene.*

Labor.—" Labor," says the Rev. Newman Hall, "as a mighty magician, walks forth into a region uninhabited and waste; he looks earnestly on the scene, so quiet in its desolation; then waving his wonder-working wand, those dreary valleys smile with golden harvests—those barren mountain slopes are clothed with foliage—the furnace blazes—the anvil rings—the busy wheels whirl round—the town appears—the mart of commerce, the hall of science, the temple of religon rear high their lofty fronts—a forest of masts, gay with varied penmons, rises from the harbor—the quays are crowded with commercial spoils, the peaceful spoils which enrich both him who receives and him who yields— representatives of far off regions make it their resort—science enlists the elements of earth and heaven in its service—art, awaking, clothes its strength with beauty—literature, new born, redoubles and perpetuates its praise—civilization smiles—liberty is glad—humanity rejoices—piety exults, for the voice of industry and gladness is heard on every hand; and who, contemplating such results, will deny that there is dignity in labor?"

Controllng Sex in Butterflies—A suggestive article as to the possibility of controlling sexes in butterfles has been communicated to *The American Naturalist* by Mrs. Mary Treat, and from the results of numerous experiments she finds occasion to believe that larvæ to which the freshest and most tempting food was supplied in unlimited quanity nearly always developed into female butterflies while those for which the supply of food was limited almost as uniformly proved to be males, Dr Packard is, however, inclined to think that the sex of this insect, as well as that of all animals from eggs, is determined at or about the time of conception, or at least, early in the embryonic conditions In the honey bee, especially, it has been proved that the sex is decided at the time the egg leaves the oviduct. The sex in man ,according to Koeliker, becomes fixed toward the end of the second month of œtal life.—*Scientific American.*

A Sure Test as to Whether Life is Extinct or Not.—A few years since a price was offered by the Paris Academy of Science for a sure and easily-applied test of the presence of death. In answer to this, Hugo Magnus, of Breslau, contributes a paper on this subject to Virchow's *Archives*. Dr. Magnus directs his attention to the vegetative phenomena, since among these may be found those peculiar to functlons which will bear being reduced to a minimum, but upon the stoppage of which death follows at once. Now there are two symptoms the functions of which are never completely suspended during life, viz: the circulatory and respiratory. Choosing the former of these, Dr, Magnus resorts to a very simple method, which is thus described:—

"If a limb of the body—a finger is best for the purpose—be constricted by a strong ligature quite tightly, there will be seen if the subject be yet alive, a reddening of the constricted member. First, the part in question becomes red, and the red color becomes darker and darker, and deeper in hue, till it is finally converted into a bluish-red, the whole being, from its tip to the ligature which encircles it, of a uniform color, except, that at the region immediately around the ligature itself there is to be seen a narrow ring, which is not bluish-red but white." On those whose skins are thickened and hard from work it may be necessary to choose some other part than a finger, as, for example, a toe or the tips of the ear. This evidence is as sure to be brought about in the living body as it is certain to be absent in the corpse. The bluish coloration of the finger-tips, so often observed in the dead body, need not be regarded as a source of fallacy, for after ligation of a finger, as long as life is present, the whole limb, from the point of ligation to the extremity, will be uniformly blue-red. Large limbs, on account of offering facili-

ties for the flow of the venous blood through the deeper veins, do not serve as well as the small extremities, in which the tissues are more easily compressed against bone.—*Med. Record.*

False Teeth.—False teeth have their disadvantages as well as their advantages. They caused the death of Cuvier and the discomfiture of Lord Brougham. Cuvier, impatient at the interruptions of that perpetual interrupter, M. Glais-Bazoin, in the National Assembly, rose so impatiently to answer him, that he jerked his teeth on to the floor of the Assembly, and, stooping not less precipitately to pick them up, fell head foremost, and struck his head against the floor so heavily as to give rise to the illness which proved fatal to him. M. Glais-Bizoin, then a very young man, promised himself to abstain from his fatal habit of incessantly interrupting; but he was incorrigible. Lord Brougham, in the course of the proceedings of a great meeting of the Social Science Association, of which he was President, was stopped in the middle of a speech by his teeth falling out. After groping on the floor, and on presently resuming his speech, he made the best of the incident by observing that "our teeth are the source of troubles from infancy to old age."—*Brit. Med. Jour.*

Dental Accidents During Anæsthesia.—At the last meeting of the Pathological Society of Great Britain, Mr. F. Henry said he would like to make a few observations in respect to an incident which occurred a few days since in his operating room, and which suggested a probable cause for the unfortunate casualty at Exeter. A lady, desirous of having a lower molar tooth, very much decayed, removed under nitrous oxide, was placed under the influence of that agent. It was administered to her twice, and upon recovering after the second administration she exclaimed that she could not swallow and was choking. From these sensations she was relieved after one or two attempts at swallowing. Upon examining the tooth, it was found that two sides of the crown were missing. They were searched for, but could not be found. They had doubtless lodged somewhere in the throat, probably under the glottis. Viewing this case in connection with that at Exeter, he thought it most probable that in the latter the missing fragment of the prop lodged under the glottis and finally in the larynx.—*Med. & Surg. Reporter.*

Leprosy stills prevails to an alarming extent in the Sandwich Islands. The doctors can find no remedy. The lepers are isolated and live in large communities by themselves under rigid laws of exclusion from other mortals.

Professor Haeckel on the Origin of Man.—In an article in the *Scientific American* of April 12, 1873, certain theories of Professor Haeckel, of Jena, are set forth. These to say the least, are very curious and apparently opposed to every principle of common sense.

In substance, the Professor says that man at the outset is an egg, a little cell the one hundredth of an inch in diameter, The egg becomes an embryo, brought about by the origiual cellule being divided into two, these two into four, etc., continually increasing in number until a quorum is formed, when they lay their heads together, so to speak, nominate committees to attend to particular duties. and finally, all agreeing, like good citizens, to abide by the laws (made by themselves?). set to work to form a perfect man or woman precisely like those who for thousands of years have been striving to obtain a living from the bosom of their mother earth. But stay, I am too hasty. We are to suppose that in case our present circumstances are ever so altered as to render it neccessary that man should become a monkey or a winged individual like the angels our forefathers believed in, then these tiny cellules will go to work accordingly and clothe us with hair or feathers, as the case may be.

What a beautiful theory! What wisdom these little cells display in thus cutting themselves up indiscriminately to build up the perfect man with his noble nature, his glorious ambition, his high attainments.

Can it be possible that any reasonsble person would entertain such a theory as the above? Must we be led to believe that particles of matter (themselves composed of elements well known to us) are capable of acting on concert in their own responsibility, as it were, like ourselves and so creating man to suit the circumstances, as we would construct a goverment or a machine for certain ends or purposes? Granting even this to be so, then we must go back to the elements of which the embryo itself is formed. By what power are these brought into the form of an egg or cellule? Since the same elements combine to form man and monkey, trees and plants, surely we must look for the orignal reasoning power in them, if we discard the idea of a Supreme Creator, and not in any particles or cellules formed by them. Thus we have oxygen, hydrogen, nitrogen and carbon transformed into reasoning beings, who either created themselves or have existed through eternity, and have the power of creating at pleasure man, beast or plant from their own substance

Here we see that certain of mankind, in their frantic endeavors to ovethrow the claims of theology and the distasteful idea of a Supremee Being, with power to reward or punish, unconsciously set up a god formed of the elements, who has at least the power to create and destroy at will; for we must not lose

sight of the fact that to plan and accomplish a given purpose requires an effort of will, be it natural or supernatural, and that there is a vast difference between the controlling influence of mind and the passive obedience of matter to established laws; the existence of which laws itself implies the prior existence of a law making power.

I would suggest that the learned Professor turn his attention to the moral of an old and well known fable, for his great mountain of words, with monstrous labor, brings forth an exceedingly microscopical mouse of proof for Mr. Darwin, who will surely exclaim "save me from my friends."—*Scientific American.*

J. L., Washigton, D, C.

Dangers of Chromic Acid.—Mr. Gubler remarks in the *Edinburgh Medical Journal*, that chromic acid is one of the most powerful of caustics. Only the monohydrous sulphuric acid at all approaches it in strength. It acts rapidly, setting free a considerable amount of heat, so that the temperature may rise to 125 or 150 degrees. If we plunge a small animal, such as a mouse, into a concentrated solution of chromic acid, it is instantly reduced to a cinder; and the ebullition is so great that unless care be taken, the mouse and a part of the solution are forcibly ejected.

This caustic applied over an extensive surface may therefore give rise to a deep slough. Further, the absorption of chromic acid is not free from danger, and patients have been poisoned by a too extensive application of this caustic poison to the surface of their bodies.—*Med. & Surg. Reporter.*

Glycerine Lotion.—For softening the skin of the face and hands, especially during the commencement of cold weather, and also for allaying the irritation caused by the razor:

Triturate 4½ grains of cochineal with 1½ fluid ounces of boiling water, added gradually; then add 2½ fluid ounces of alcohol. Also make an emulsion of 8 drops of attar of roses with 30 grains of gum Arabic and eight fluid ounces of water; then add three fluid ounces of glycerine and 10 fluid drachms of quince mucilage. Mix the two liquids.—*Zeitschrift, etc.*, 1873.—*The Southern Med. Record.*

It is stated that a little girl in Philadelphia died a few days ago from hydrophobia taken by biting off a thread after mending a rent in her dress which her dog had torn in play. She had the disease in its most frightful and distressing form. This is probably a case of idiopathic tetanus or lock jaw. the symptoms of which often simulate to some extent those of hydrophobia.

The Wonders of the Deep.—During the recent passage of the British exploring ship Challenger from England to the West Indies, the sounding line and dredge were kept constantly going. The former showed that a pretty level bottom runs off from the African coast, deepening gradually to a depth of 3,125 fathoms at about one third of the way across to the West Indies. If the Alps, Mont Blanc and all, were submerged at this spot, there would still be half a Mile of water above them. Five hundred miles farther west there is a comparatively shallow part a little less than two miles in depth. The water then deepens again to three miles, which continues close over to the West Indies. At the deepest spots both on the east and west side of the Atlantic, the dredge brought up a quantity of dark red clay, which contained just sufficient animal life to prove that life exists at all depths. No difficulty was experienced in obtaining these deep sea dredgings, and it was merely a question of patience, each haul occupying twelve hours. In depths over two miles little has been found, but that little was totally new. One of the lions of the cruise is a new species of lobster perfectly transparent. Not content with obtaining animals with eyes so fully developed that the body may be said to be an appendage, a new crustacean has now been dredged up, in which the body has cut itself clear of the eyes altogether, and the animal is totally blind. It has no eyes, or even the trace of an eye. To make up for its defiency Nature has supplied it with the most beautifully developed, delicate lady like claws, if one may use the term, it is possible to conceive. Nearer the West Indies, in a depth of only half a mile, some similar creatures were brought up, and here the claws, longer than the body, are armed throughout with a multitude of spike-like teeth, looking more like a crocodile's jaw than anything else. At a short distance from Teneriffe, in a depth of a mile and a half, a rich and extremely interesting haul of sponges and coral was obtained, but the latter was unfortunately dead.—*Scientific American.*

The smallest known race is that of the bushman of Southern Africa, the largest that of the Patagonian of South America. The mean hight of the bushman is four feet three and a half inches, and that of the Patagonian five feet eight inches.

Neuralgic Pill. Brown Sequard.– ℞. Ext. belladon., one-sixth of a grain; ext. stramon., one-fifth of a grain; ext. cannab. ind., one-fourth of a grain; ext. aconit., one-third of a grain; ext. opii, one-fourth of a grain; ext. hyosciami, two-thirds of a grain; ext. conii, 1 grain. For one pill.—*Detroit Review of Med. & Phar.*

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ARTICLE I.

Kentucky and Indiana State Dental Associations.

The Association for the "Protection of the Rights of Dentists, of Kentucky," against illegal patents, met Wednesday morning, June 4, at 9 o'clock, with Dr. Goddard presiding. The meeting was a large and enthusiastic one, and a number of new members were added to the roll.

After listening to some interesting remarks by Dr. Keely, of Ohio, which were followed with some discussions of the subject by various members, transacting some unimportant business, the Association adjourned, subject to the call of the President, having been in session about forty minutes.

MORNING SESSION.

After waiting some time for the arrival of the Indiana Association, the joint meetings of the State Dental Association of Kentucky and Indiana was called to order at half-past ten o'clock.

After prayer by Rev. J. H. Heywood, the president of the Kentucky Dental Association welcomed the Indiana Association in the following words:

Mr. President, and Gentlemen of the Indiana State Dental Association:

It becomes my official duty to extend to you, in behalf of the Kentucky State Dental Association, a welcome to our State, our city and our fraternal hospitalities; and I fulfil the duty with all my heart; for in this case, official duty becomes the highest personal privilege. Yes—I regard it as my personal good that I am the organ of our Association in offices of friendship and courtesy which enlists the warmest sympathies of which I am capable.

Accept then, Mr. President, for yourself and your associates, the welcome which I extend to you ; and believe me, the cordial words of greeting which I utter are truthful exponents of our feelings. Our hearts are on our lips, and in the grasp of our hands. Welcome among us—thrice welcome! Welcome to our homes, our fellowship, our hearts! We thank you for the opportunity you have given us, of evincing our fraternal regards; and we trust that when you leave us to return to your homes, it will be with the bands of amity and friendship between our two societies more strongly cemented than before, and with personal ties renewed or freshly created which shall not be sundered this side the grave!

By the programme of arrangements for our order of business, we are to join together as one body for discussions and interchanges of thought and experience, and to that interesting feature of the occasion let me devote a few passing words.

I am irresistibly led to notice the delightful contrast which the circumstances of this occasion present to the spirit which in bygone years marked the prevailing attitude of professional brethren, each to each. For it is but a few years since each one of us considered it a duty to himself to look with suspicion on every professional brother, to conceal every new thought, every new discovery, closely within his own breast, or his own laboratory; yes, even, to lock

his door against the entrance of a brother dentist, who might, perhaps, if admitted to confidence and intercourse, pillage some of the methods on which his host prided himself, and use them in his own operations.

There was no fraternity of feeling, no reciprocity of good offices, no free interchange of suggestion and experience. But we have come to feel, thank God, that all this was contemptible by-play, unworthy of men of thorough scientific knowledge and progress. We have come to believe that when any man throws his contributions of thought, experience and skill into the common stock, he grandly benefits himself as well as the world at large. This magnanimity and philanthropy return home to bless him more abundantly. Fraternity is now the word!

Knowledge loves to have the votaries who sit reverently at her feet clasp each other's hands in a close embrace as they do so, for her sake, for the world's sake, and for their own sakes! By as much as *we* claim to be lovers of truth and lovers of science, above the petty arts of the selfish and narrow pretender, we glory in the intercommunication of of knowledge and good offices. Now all are brothers; we affiliate in associations; we meet to impart all we know to each other, and to put each other, if possible, on a higher plane of power and opportunity. We do not fear our instruments, our materials, or our knowledge will be stolen from us. On the contrary, our offices and our laboratories, with all they contain, are open to the examination of every worthy brother. Yes, and our hearts and purses are open too.

It is interesting to note that this is only the second instance of the union of two State societies in joint sessions for mutual discussion and improvement; that of the Illinois and Iowa associations, who lately met together, having been the first. This is the second; may it not be the last! But may the exercises of this occasion so bind us together that we shall be eager for a repetition of the genial and profitable fraternity, and relations be this day inaugurated which shall

be renewed with ever-increasing lustre and profit, so that in the far future our successors shall rise up and call us blessed! Once more, Mr. President, I tender you a most cordial welcome.

In response, the president of the Indiana Dental Association, Dr. Wells, returned thanks in the name of the members of the association which he represented to the Kentucky Association for the kindness and fraternal feeling which had been shown toward them, which they should not fail to reciprocate when the occasion offered. They had come to seek knowledge and light with their Kentucky brethren. Although separated by geographical lines, they were united in bonds of fraternity and affection, and hoped they would continue ever to be so.

Dr. Priest read the minutes of the previous meeting, which were approved, when the following subject, the first on the programme, was announced as in order:

"Contour filling—what are its advantages, what its permanency, and what the essential points to be observed?"

Dr. P. G. C. Hunt, of Indianapolis, who was selected by the executive committee to open the discussions on this point, arose and stated that he had with him a few casts of cases which had come under his treatment. He preferred to change the subject a little, and would take his starting point at the last clause, namely; "What are the essential points to be observed?" The main subject under consideration was contour filling, or restoring a tooth to shape. He treated at some length of his methods of proceeding, saying that when a tooth is broken down, in whole or in part, the dentist must draw largely on his ingenuity. He presented casts of cases in which the teeth had been largely broken down, the teeth as restored often appearing to be principally constructed of gold. It is necessary to first remove all deceased parts, or all decayed bone, so as to leave a healthful border for the filling. The next step is to so secure the gold that there is no danger of its becoming loose. Screws he regarded as very valuable in some cases to secure con-

tour filling, but he does not regard them as absolutely necessary in any case. He believed in letting the lateral enamel stand for lateral support for the filling. In many cases he fastened the filling by inserting gold wire in the root, an arrangement which he regards as more cleanly and more durable than the pivot tooth.

The advantages of contour filling are that it presents a smooth surface to the tongue, a better surface for mastication and for articulation.

In regard to permanency he had not much experience. He had been using the contour filling for three or four years, and found that it would wear, but not so rapidly as the two surfaces of bone would.

Dr. Hunt continued his subject at some length describing processes and material. The discussion which followed took a wide range; over all the ground covered by the question as stated.

On motion the Association agreed to meet at 9 o'clock, and adjourn at half-past 12 o'clock in the morning, and to meet at 3 o'clock and adjourn at half-past 6 in the evening.

After further discussions of the question presented for the morning session, the Associations adjourned at half-past twelve.

Afternoon Session.

The Associations were called to order by the President of the Kentucky Association, Dr. W. H. Goddard, at twenty minutes after two o'clock.

The consideration of the second subject was passed over, as no member had any remarks to offer.

The third subject was taken into consideration. This subject was stated as follows:

The importance of preserving the vitality of the teeth, and what are the best means for securing it.

Dr. Taft, of Cincinnati, read the following paper on the subject of diagnosis in practice, by Dr. D. C. Hauxhurst:

DIAGNOSIS.

I have hinted at some of the difficulties to be met with in tracing symptoms to their causes in a former number of this journal. Before developing the differential diagnosis of special affections, it seems proper to offer a word on the sympathetic relations of the different parts of the organism.

The intricacy and obscurity of the numerous cross-lines of sympathy which bind together the parts and functions of the body, declaring themselves with especial emphasis during disease, often prove very embarrassing to the practitioner, and sometimes constitute his principal hindrance to a correct diagnosis. The files of our dental journals contain numerous illustrative cases.

The direct response which the teeth makes to changes in the blood and to states of nutrition, and the reverse action by which causes at work in the teeth, produce serious and startling, often intensely damaging effects upon the blood and other parts, are so obvious as scarcely to require mention.

If causes are set in motion in the nervous system sympathetic action spreads, and not unfrequently fall into channels of communication leading to the dental organs, from which reflective waves of influence beat back upon the general system.

The mixed character of these effects, and the embarassment which the practitioner who does not understand the sympathetic relations of the parts of the body, must meet with in attempting a diagnosis, serve to impress their importance.

In diagnosing a case it should be remembered that the animal body is an organic unit, whose parts are mutually dependent, and that by consequence disease in any one organ is liable to introduce morbid action into any other, or even many others. As an insignificant atom of dust may disturb the motions of every wheel in a watch, so a morbific agent introduced at any point in the organism may seriously dis-

turb or entirely arrest action in the entire machinery of the animal body.

It should now be called to mind that diseased action is transmitted through certain channels more readily than others; that it is obedient to laws of sympathy and susceptibility on the part of organs to which it is transmitted; and that slight and transient causes may divert it to unaccustomed channels, and to unusual tissues and organs.

In diagnosing cases it is necessary to know something of those relations and their causes; otherwise I know not how we shall be able to trace the usually obvious symptoms to their often entirely obscure pathological causes, and form in the mind an accurate picture of the extent, location and character of the disease.

In some instances the symptom brings with it the evidence of its distant origin, and the path backward may be easily traced. But more often the dependence of the part which makes the outcry and contains the only visible sign of disease, upon some other and undeclared terrritory of morbid action, is quite hidden. Neither our own nor the patient's senses can point it out to us. It is only to be approached by a consecutive chain of reasoning, on the basis of the laws of sympathy and relation between the parts of the animal body.

And no matter how well we are armed with a knowledge of these laws, we will often meet with the most embarrasing difficulties. The clue which we have been following by a careful logic, backwards to the source of trouble, sometimes ends suddenly in a tract, entirely barren of evidence. It is obvious that he who best understands physiological and pathological phenomena, and can most skilfully trace their relations, will be best prepared to make a difficult diagnosis.

It is worthy of remark that while much has been written in a careless way about the sympathies of organs and parts with each other, but little had been done toward tracing the laws of this sympathy; until this is done our efforts at diagnosis must often be blind and misdirected.

We have illustrative cases on record. Our case-book and journals are full of cases indicating special extraordinary sympathies of the teeth and associate parts with distant organs, functions and pathological conditions.

In this way the eye, the ear, the scalp, the neck, shoulders, the stomach, liver, spinal cord, the limbs along with the functions of fœcal excretion, menstruation, gestation and lactation have been pointed out as sympathizing at times with conditions of the teeth, while epilepsy, diseases of the antrum, hysteria, trismus, uterine affections and several important nervous diseases have been shown to possess unmistakable connections with their pathological states.

But for the most part the cases on which these deductions rest have not been carefully studied and recorded. Their history has been imperfectly given: the general state of health in the patients has received little attention; diathesis has been largely ignored; and many facts which it would be exceedingly desirable to know have been omitted.

I have in my mind some admirable exceptions, but they are rare in the extreme. It is evident that before we can have any very complete development of those special forms of pathological sympathy, which must in part constitute the basis of diagnosis in our profession, we must learn how to observe and record cases.

Those already recorded are highly valuable, but might have been much more so. They have pointed out to us special sympathies, and in many instances have furnished hints toward general laws of sympathetic actions. What important conclusions may be drawn from a careful classification and comparison of these materials, remain to be seen. It is evident that the attainments of general principles must be facilitated by whatever of accurate observations the future may record for us.

In this article I have only aimed to throw out a few hints to put the young practitioner upon the right method of diagnosis. Any accurate statement of the laws of that immensely complicated and intricate weft-work which makes

up the sympathetic relationship of tissues, organs and functions, belongs of course to the differential diagnosis of special diseases, and would be best made in connection with the phenomena of each.

This subject he considered a very important one, relating to daily practice of every dentist. Teeth are affected by causes remote from the mouth. These cases are difficult to treat without knowing these remote causes. Disorder of other organs will extend their influence to the pulps of the teeth whether exposed or not. In some cases of uterine irritation acting upon the teeth, it is difficult to trace the action or to understand the cause. This action Dr. Taft illustrated with various cases which he has treated. Other nervous affections will extend their influence to the teeth and the parts around them. Dentists should understand well the pathology of the system. It should be a subject of study with them; otherwise they are laboring in the dark. Considering the ignorance of some dentists on this point it is no wonder their best operations often failed.

Dr. Taft continued on this subject for some time, endeavoring to show the necessity to the dentist of thorough knowledge of the human system.

Considerable discussion of the subject followed, and many interesting instances were adduced of cases bearing on this point.

The third question was taken up for discussion:

Importance of conserving the vitality of the teeth, and what are the best means of securing it?

Dr. Taft led the discussion on this point, a discussion which was participated in by most of the members.

The chair announced the following operatives for the clinics of the following morning: Drs. Keely, S. Brown and Merritt Wells, of Indiana.

Also, that at half-past 4 o'clock the next (third) day Dr. Seymour would fill a tooth at his office, on Chesnut street, between Second and Third, by request.

Dr. W. F. Morrill then read the following paper:

THE DENTIST OF THE FUTURE.

American dentistry, from the earliest annals down, must be conceded to be of significance, interest and profit. Casting our eyes over that period when dentistry first began its existence, we recall the giants—not pigmies—who lived in those days. Among these were Gardette, Greenwood, Harris, Palmby, Townsend, Badger, Maynard, and others, who became fixed stars in this firmament of pioneer dentistry, and whose effulgence still glows with a steady, ineffaceable radiance. We venerate their names and their deeds, for they were glorious. Conspicuous as these bright examples are in our history, conspicuous as many illustrious which still live to adorn our profession to-day, we cannot resist the temptation of throwing forward the horoscope, and of snatching a gleam of what shall be *the dentist of the future.*

Comparatively unknown to the pioneers of dental practice, were the researches of science and the ingenuity of art now made subservient to our purposes. The precious germs of knowledge, once so scarce, have multiplied and been spread broadcast in our day, so that each representative of our vocation may increase his store of information without stint or hindrance. Notwithstanding these sunny avenues of our intellectual life, sweet and attractive as the palm colonnades of a tropical clime, where the fountains of truth scatter their germs, the number of dental practitioners who wander in these grateful retreats, and pause to sip the waters of science are, alas, too few. We could wish that responsibilities of the future, which is to be a period not of apathy, but of industry and science, could be more evenly distributed.

Defective education, formidable and wide-spread, besets our progress. But the echoes of reform, reform, reverberate from the shores of the Atlantic to the slopes of the Sierras along the Pacific.

The exigencies of the times, the requirements of humanity, alike demand that he who would reach the *ultima thule*

of our profession, must possess high attainments. Broader and more thorough culture is demanded. A preliminary education, high and liberal, is an indispensable requisite, as much so as in other professions. The curricula of our dental colleges are tending toward improvement and excellence. The training and discipline necessary for a candidate to receive the honors of these valued institutions, and to fit him to enter upon an honorable career of dental practice, must be painstaking and scrupulously exact.

It will be no disparagement to our illustrious prototypes who have adorned our profession, nor to those who still grace it with becoming honors, to say that the dental practitioner of the future must possess greater qualifications than his predecessors. Much broader and more catholic principles, and more unselfish tenets prevail to-day among dentists than at any previous time in our history.

Prejudices and petty bickerings among the cultivated as well as among the unlearned of our calling are slowly disappearing; while men, freer and more enlightened in their moral nature, are encouraging social and friendly intercourse. The free offerings of our collective counsels and experience, which these associations themselves impart, like the irrepressible light and air of heaven, infuse fresh air and energy into the monotonous existence of every practitioner. These organizations, binding together with adamantine chains professional and fraternal sympathy, that are the instrumentalities that are destined to encompass the whole land with their recuperative energy. These are the assurances written upon the lintels of our profession. We are not, then, left in doubt as to what shall be the qualifications of him who is to be *the dentist of the future.*

The sphere of scientific research expands daily. An acquaintance with all the minute and exact discoveries of medical science should be the laudable ambition of every practitioner of dentistry who expects large results. There is no one with a brilliant record here to-day who does not possess in a large degree this culture. These observations,

made richer and more valuable by experience as time rolls on, will become the inheritance of our successors. More natural and rational modes of treatment will then be understood and practiced. The diagnosis will be accurate, penetrative, discerning. The utility and value of the teeth in their relations to human economy, to say nothing of their beauty, will be better appreciated, even among dentists. Conservative methods for their preservation will be more persistent, and rewarded with higher triumphs. Three-fourths of the cases we see nowadays, deformed with hideous artificial teeth, under this new guidance and superior wisdom, might be wearing their own natural teeth. Labor saving machines and mechanical appliances, far beyond anything we now know of, will continue to be brought to higher perfection and greater utility. And these facilities, turned into the celerity and ease of operations on the teeth, will increase the character of work performed. Our text books, embracing the results of scientific discoveries, will furnish valuable assistance to the student of the future, containing as they will, digested principles of dental science. In this list of subjects, treated of in standard works, will be: dental physiology, dental pathology, dental microscopy, and anatomy, dental therapeutics, dental chemistry, dental surgery, and dental operations by a score of authors. It must be confessed with no little mortification that few works of this kind at present adorn the shelves of our libraries. All the advantages to be derived from this service, apparently so indispensable to our present needs, will be reserved for our more fortunate successors. The current periodical literature of our profession, now so often fragmentary, loose, ephemeral, will have a more solid and enduring character. Those who shall hereafter have charge of this department, will be men who can devote all their time and attention to this one pursuit.

In taking part in these triumphs of our profession, the student will have claim to rank, fellowship and recognition among the learned. In the domain of art, which is an

indispensable adjunct to the specialty of dentistry, the results reaching higher ideals in expression, and continuing the assimilative and fusing processes of the imagination—methods far beyond any now known—will be the tempting of the future votaries of our calling. It is almost useless to predict what is fast becoming an accomplished fact: that of making the manufacture of artificial dentures a separate department. Even now there are numerous dental practitioners who devote themselves entirely to operative dentistry, lopping off the mechanical branch so far as dentures are concerned. This indicates the exercise and concentration of all the powers and faculties in one given direction, thus increasing the efficiency of this department.

With all the civilizing forces and world-moving tendencies urging us to duty and to truth, we can neither remain idle nor listless spectators, but earnest co-workers, to carry forward the great interests of dentistry which are to have such an important bearing in the future.

The great want of the present, as auxiliary to this means of preparation, is the tone of public sentiment. If we had some way not degrading, by which we could communicate hygienic laws to the masses; make them acquainted with the nature and value of dental operations; we might lay aside some of the dignity of our calling, and invade even the confines of our ethics to have this information given. Under proper guidance and judgment the channels of the press might be employed. The clergyman does not rely upon supernatural powers alone to keep the truths of revelation alive, but arouses the people to a due respect for the lessons they teach. The mission of a dentist may not have quite this eternal importance, but, during our sojourn on earth, it is some comfort and happiness to know that adequate skill to preserve the human teeth through a natural lifetime is fast attaining toward these perfections. Time in our offices, to impart instruction to patients with regard to hygienic laws specially adapted to the teeth, is too limited. Every dentist knows what comfort and ease he experiences

when he approaches a patient accustomed to dental operations; but if he has ignorance and skepticism to baffle with, how laborious he himself becomes, and how unsatisfactory are his services. True, each year carries us forward to a better condition of public appreciation of the dentist's services, yet these requirements are not all filled. The practice of our calling should have less discomforts than it has to-day. Punctuality and regularity in the attendance of patients on their engagements is not near so prompt as it should be. In the success of the practitioner of the future, it will be more esteemed a duty, and not so much dread to pay visits to his office. It will not then be for surgical or mechanical operations that these are paid, but for the purpose of gaining such advice as shall place the patient beyond the need of operations from dentists' hands; such are found in hygienic laws. Public sentiment, after these advances of our profession have been made, will be more elevated toward us, and not hesitate, as is now often the case, between the meritorious and pretender.

Empiricism will have nothing to feed its dupes. Legislation for protecting the people against quackery in our profession will be needless. The scope of his opinions will not only embrace the present wants, but extend from etiology to an assured prognosis. In a word, the dentist of the future will be the acclaimed counselor and custodian of the teeth.

These prospects, rather Utopian, perhaps, I have abiding faith to believe, are but imperfectly hinted. Nevertheless, as a co-worker upon the living tissues of that mystic life to which we are mainly dedicated, I bid you, not in the burning words of Napoleonic grandeur, "that forty centuries look down upon you;" but from the heights of the past and present ages, "countless worthies of our godlike profession point and beckon to a goal more elevated than attracts legislators and conquerors, Solons and Cæsars."

It was moved that a Publication Committee, consisting of three members—two from Kentucky and one from Indi-

ana—be appointed. The motion was carried, and the President announced that he would name the committee the next day.

The joint session then rose, and the Kentucky Association went into an election of officers, the following ticket being elected: Drs. Priest, President; Rogers, Vice President; Doyle, Secretary; Canine, Treasurer. Board of Censors, Dr. Goddard, vice Dr. Redman, term expired.

Executive Committee—Drs. Priest, Canine and Dunn, re-elected.

Adjourned.

ARTICLE II.

Mechanical Dentistry.

BY DR. A. W. FRENCH.

Though the best substitutes for the natural teeth are far from ideal perfection, they, as also those of an inferior character, are of incalculable value to mankind, and reflect as much honor upon our profession as the more conservative arts by which they may be rendered unnecessary. Two generations back of our time, the loss of teeth by disease or accident was an irreparable disaster, (fortunately, we may believe more rare than in our day,) which often drove the subject of it into permanent retirement, years before the march of time had left its unwelcome traces on other features, and the cracked and lisping voice proclaimed to all that misfortune had come, and come to stay; and when, through inscrutable causes, the teeth had one by one all left the hardening and shrivelling jaws, and the power of thorough mastication become only a memory, the chin seeming ever to thréaten an assault upon the nose, and the most conspicuous signs of old age sat upon the countenance obvious to all beholders, though perhaps middle life had not yet been reached, the joys of existence, not yet half tasted, were resigned, and hopes of the future were relinquished. Small gaps in the teeth were sometimes filled, for

occasions, with wax; afterwards, feeble attempts were made to secure in the broken ranks the amputated crowns of human teeth, or of the teeth of animals, by the use of wires or silk ligatures, nothing more being expected than the preservation of appearances; no one anticipating the time when the more essential power of the perfect mouth should be restored. These contrivances were followed by attempts to utilize the semicylindrical and thick enamelled ivory of the tusks of the hippopotamus. Sections of these tusks of the length required for the teeth, were sawn off, and blocks of a sufficient number of teeth were carved in the section, the curved form of the piece enabling the skillful artist to give the block the shape required without cutting entirely through the thick enamel. The base of the blocks was made to assume approximate fit to the jaw by repeated cutting and trying. The blocks were retained in the mouth by wires or ligatures passed through a hole at each end, and tied to any remaining teeth there might be. When there were no teeth to which to secure them, the dentist was not needed. His powers were not equal to the exigency. These attachments were replaced from time to time, by the dentist, and my experience, I may say in passing, goes back to the time when these blocks were worn, and though I never had occasion to make them, I have replaced the ligatures on some of them. It is believed that these structures were among the first attempts to restore masticating teeth; and as we see new sets of teeth which seem to have been made on a model from some other mouth than that in which we see them, become in time not only endurable, but useful, and apparently indispensable to the wearer, so these clumsy masses of ivory, if their supports were not dragged out of the jaw by them, were found, after long use, to become comfortable and even quite useful to the wearer. But when the art of taking impression of the jaws came into use, one half of the difficulties of making artificial teeth were overcome, as a plate of silver or gold could be fitted to the jaw, and the teeth, whether human, or sheep,

or carved ivory, were adapted to the plate, and nothing was lacking but teeth composed of some material, which, while it presented a natural appearance, should not absorb the fluids of the mouth, as all the substitutes yet used did, to a degree quite offensive to taste and smell. These were not long wanting, and the germs, if I may so call them, of the present porcelain teeth, were invented. The smaller the number of the teeth required in any case, the surer the operator felt the success in the insertion of plates. A safe and sure fastening was a great desideratum, and whole upper sets were held in place by springs attached to rings or caps placed around lower teeth; and it was many years after it was found that an upper plate which had been long worn, would stay in place without visible attachments, before springs were found to be not indispensable, in cases of both upper and lower sets. The sense of insecurity which most people experience when they first receive a full set of teeth, it was supposed would be permanent unless the plates were in some way secured, and springs were applied to every set. The methods of taking impressions, the soft metals used for models, and the very imperfect swedging of the plates, sufficiently account for the length of time it required to learn that the pressure of the air was a force which could be utilized in the retention of sets of teeth in the mouth. Articulation of teeth, especially in cases of full sets, was imperfectly understood and performed, and this leads me to make a remark or two on that part of the mechanical dentist's work.

An accurate impression is not of more importance in the construction of full dentures than exactness in articulation. This, indeed, may make all the difference between success and failure, and will make as wide a difference in the aspect of the patient as in the ability to properly and easily masticate the food. The adhesion of the plate to the jaw may be very slight, and yet the teeth perform their functions without getting out of place, if the grinding surfaces come together correctly, while the plates would need to be riveted

to the jaws to keep them immovable, where the articulation was very imperfect. Good articulation is not gained by the antagonism of the faces of the teeth only, but it is requisite that the space between the jaws should be properly divided between the two arches, so that neither shall be too long or too short. For determining this, I know no rule. The good judment of an experienced dentist must decide for each case, and an error here may be attended by unpleasant consequences, though the fault may be unsuspected. An excess of length in the lower set is not quite as fatal as the reverse, but it will cause the patient much and protracted embarrassment.

When we are required to adapt a lower set of teeth to an upper set of natural ones, which from having had no antagonists for a considerable length of time, have come down from their places two or three lines, though still firm in their sockets, the division of space is not left to us. It is with difficulty that a set can be made entirely satisfactory under these circumstances. If, however, the grinding surfaces are accurately adapted to one another, the wearer may overcome all difficulties, and the teeth become useful in time. A contrivance of nature, by which the masticating power is greatly increased, the arched form of the grinding faces of the molars and bicuspids, which may be observed in complete sets of natural teeth, is not often imitated in the sets most commonly used at the present time. This effect could be best produced in the construction of the continuous gum teeth; next with plain plate teeth, and gum plate teeth; but is hardly attempted with the blocks now so generally employed. A strait line from the canine to the last molar, defines the shape of a large proportion of all the sets we now see. This error in construction renders the teeth much less useful and effective than they might be, but it simplifies the dentist's work, and helps him to cheapen his product and adapt it to the demands of his market. This error is accompanied by another which is sometimes made necessary by it. This is the even occlusion of the

incisors, or the "closing square," as it is sometimes called; a faultry plate may be made practicable or wearable by turning in the superior incisors so that they shall meet the lower ones, and the foward tilting be prevented. But this misarrangement is at the expense of all naturalness and expression, and clearness of vocal articulation. It, however, reduces the labor and the study of the operator to a minimum, and is, accordingly, extremely common. Perhaps a major part of the whole sets of teeth now worn, both upper and lower, presents a perfect plane on the griding and cutting surfaces, and if turned down on a table every tooth would rest on the board. This we all know is a great departure from our model, nature; but long use of these imperfect substitutes for natural teeth makes them tolerable to the wearer, and bearable to the viewer. They will continue in general use until the people, being more enlightened, call for a higher grade of culture in the dentist, and the display of more art in his work.

It is believed that nothing has occurred since the last meeting of the Illinois Association to change the views of any member on the resolution then unanimously passed, that the good of both dentists and patrons would be promoted by a general abandonment of rubber, and a return to the use of metal plates. I have observed with care the effects of wearing rubber, next to the mucous membrane in all the cases that have presented; and in nearly all there was a turgidity of the vessels of the membrane indicative of irritation or of heat, which is not seen where metal plates are worn. Chronic nasal catarrh has made its appearance in several persons coincident with the wearing of rubber plates, and further investigation may demonstrate that the one was the cause of the other. It may be well for all dentists to scrutinize closely the condition of all mouths in which rubber is worn, and we can learn in time to what extent it is deleterious. Without pretending to give satisfactory reason for the fact it is a matter of observation that absorption goes on much more rapidly under a rubber than a metal

plate, and the adhesion is consequently sooner lost. This fact, making it necessary to renew the teeth quite often, may be a sufficient argument with economical people to persuade them to choose gold as being equally cheap when the expense is spread over a long period of time. Absorption, however, in some cases, is constantly and steadily taking place, whatever material has been chosen for the plates, and in time the ridge of both jaws entirely disappears, until the surface to be covered by a plate is as flat as the palm of the open hand.

Fortunately in most of such cases the soft tissues have not been absorbed to the same extent as the bone, but have shrivelled or gathered into the smaller space left for them, and from a soft cushion for the plate, to which it readily adapts itself, and affords sufficient adhesion to retain the plate in place. When this is not so, and the palate is at once flat and hard, the leverage of the teeth, owing to their extreme length, being considerable, the best fitting set of teeth may not be entirely satisfactory without extraneous supports.

In the construction of *partial* sets, the opinion that gold should be exclusively used has been so often and so generally expressed by all dentists, that it is not my purpose to urge that practice here. It looks a little like imposing upon a good natured patient to cover his entire palate with rubber two lines in thickness, in order that a vacancy or two in his incisors may be filled. It would appear to be the substitution of a greater for a less evil. A very small plate of gold will sustain and keep in place several teeth, if adapted in the best way. In some very deep jaws, of which you get but imperfect impressions, and where a broad plate will be a little less perfect in its adaptation than the impression, a quite narrow plate just resting on the ridge to which it may be easily fitted, may be secured by clasps embracing either bicuspids or molars. If teeth are short, and no space exists in which a clasp may be inserted without fileing, a pair of little horns on each end of the plate,

may be made to embrace simply the necks of the teeth chosen to support the plate. These hooks can be sprung into their places and will give sufficient support to the set. As the embracing part is but little thicker than the plate, it need cause no more decay than a close fitting suction plate. Our aim should be to place in the mouth as little matter as will answer our purpose, and we can often make a comfortable and durable set, either of a few or many teeth, which shall have less bulk and occupy less space than did the natural organs, with their gums, alveoli, &c. In choosing between clasps and atmospheric pressure, I am sometimes influenced by the degree of refinement of the patient—having learned that very coarse and rough persons, for whom hooks of steel would be none too strong, will soon destroy the delicate adaptation necessary for the latter, while persons of a different nature may wear them till the natural teeth by their side have all departed.

For incisors, I am in the habit of using plain teeth, unless there has been such an amount of absorption as to give plenty of room for artificial gums, regarding it a common mistake to attempt to force in gums where the space is already occupied. If the elevating of the lip displays the plate, the latter can be cut away around the teeth. Plain teeth have the advantage that they can be put on with proper and natural inclinations, (which is far from the case with gum teeth,) and a correct expression can be given to them. The margin of the plate should be made very thin, there being just sufficient gold to cover the base of the tooth.

Our first and greatest efforts should be made to preserve natural organs; but when through our inefficiency or the neglect of the patient, these are gone past recovery, the skill of the mechanical dentist can do much to restore youthfulness and health, and place the patient back to that period of life when the ravages of caries were unknown to him. Indeed, many people who had suffered almost constantly, through childhood and youth, all the pains attending the

gradual dissolution of the teeth, look back with no regret to their total loss, and deem the day which witnessed the removal of the last of them, a day of happy deliverance from intolerable suffering. This joy would not be unmixed with grief, if the disfigurement and incapacity caused by their loss was to be permanent and life long. But the mechanical dentist has restored their features and their powers without renewing their sufferings; and he may be ranked among the benefactors of his race. His services are gratefully remembered by those who enjoy the results of them. One lady who had worn sets of teeth for many years, witnessing the writhing of her daughter under the operation of preparing a cavity to fill, exclaimed, with the deepest feeling in the tone of her voice, "I *pity* those people who have natural teeth." A gentleman said to me that his wife would not part with her set of artificial teeth for all the natural ones in the world. Another said that he would not exchange his artificial set for any natural ones he ever had. Many others speak in tones of profound gratitude of the comfort bestowed by the hand of the painstaking dental artist. But these expressions are doubtless familiar to you all, and should and do serve as a lively stimulus to your resolves to do the most and best you may for the amelioration of the sufferings of mankind.

ARTICLE III.

American Dental Convention.

NEW YORK, June 20th, 1873.

Mr. Editor:—The committee of arrangements would respectfully inform the members of the profession, that the nineteenth annual meeting of the American Dental Convention will be held at Saratoga Springs, on the 12th day of August, (second Tuesday,) commencing at 10 A. M.

Messrs. Breslin, Gardner & Co., of the Grand Union hotel have generously tendered their large hall, (rooms for com-

mittees, &c.,) also, their splendid parlour grounds and band of music for our social entertainment. The town authorities have also offered us a very suitable room for our meeting, in the new and magnificent hall recently erected there. The committee have made arrangements for the display and exhibition of dental materials and appliances of all kinds; also, for clinical operations during the entire session.

Dentists and others desirous of exhibiting instruments, materials, or improvements in any department of dentistry, are particularly invited to present them as early in the session as possible, and to notify the committee of their intention to do so. As August is a very busy month with hotel keepers, it will be advisable for those intending to be present, to notify the committee of their wishes, &c. The committee will see that good; accommodations are provided for all who give timely notice, and for others as far as possible, and will endeavor to make this meeting a pleasant and profitable gathering to all. The profession generally, are cordially invited to be present.

J. G. AMBLER, Chairman of Committee,
25 West 23rd Street, New York City.

American Dental Association.

The thirteenth annual session of the American Dental Association will be held at Put-in-Bay, an Island in lake Erie, a short distance from Sandusky, Ohio, commencing Tuesday, August 15th, at 10 A. M.

Route—Steamboats leave Detroit daily at 9 A. M.; boats also leave Toledo daily (and Cleveland, I believe) for Put-in-Bay. Passengers either from the West or East, on the Lake Shore and Michigan Southern Railroad, or on any of the roads terminating or passing through Sandusky, can take boats for the island at 9 A. M., and at 3 and 7.30 P. M. Passengers on the Baltimore and Ohio Road arrive at Sandusky at 6.30 P. M., in time for the 7.30 boat.

M. S. Dean, Secretary.

SELECTED ARTICLES.

ARTICLE IV.

Furrowed Enamel in Connection with Syphilitic and other Exanthematous Diseases.—Concluded.

BY S. P. CUTLER, M. D., MEMPHIS, TENNESSEE.

INFECTION.

Dr. Wm. W. Cable, of Pittsburgh, (*Medical and Surgical Reporter*,) speaks of communicability of both primary and secondary syphilis, by contact with mucous membranes, both primary and secondary sores ; by kissing, when the lips are affected with secondary sores, communicating the disease in its secondary form, without any of the acute symptoms, excoriated tonsils and blotches on the skin being the leading features of the reported cases.

The cases cited not only show that the disease can be conveyed from secondary sores to an untainted person, but that the person becoming so affected is capable, also, of re-communicating the disease to a third party.

The question here is, can the secondary form be produced by inoculation into the skin? Would it have to take on the acute form? Whether or not the duration of the acute disease would be shorter than when communicated from fresh chancres?

The writer speaks of its communicability to the lower animals, and of its communicative character.

This horrible disease, in many of its phases, resembles small pox and its kindred types ; others again, very unlike. Small-pox may be produced by inoculation, or inhalation, though the former is less violent. Syphilis only by inocula-

tion, and hereditary transmission, the latter never occurring in small-pox and kindred diseases, as already stated. Small-pox has its three characteristic stages, so has syphilis, though somewhat dissimilar. There is the initiatory stage, incubative stage, the febrile, or stage of systemic reaction, then subsiding into the third stage, in the one case, convalescence, in the other, constitutional taint, fixed in the organism, and transmissible: In the one case, immunity from genuine subsequent attacks, as a rule; in the other, not, as a rule, only as an exception; the rule is a modified form, somewhat as in small-pox.

I am not quite certain that it is entirely safe for a healthy person to inhale the breath, for a considerable length of time, of a person, during the febrile stage of syphilis. If no actual taint is transmitted, there might be a very unhealthy thy condition of the blood established in certain susceptible subjects, that might degenerate into some form of constitutional disease, of a non-infection or contagious nature. I do not claim that such actually takes place often, if at all.

ANOTHER CASE OF FURROWED ENAMEL.

I saw a young man, a short time since, about 25 years old, of sanguine temperament, middle size, hair light, eyes blue, form good, whose twelve front teeth had two deep grooves across the enamel, on the labial surface, near their cutting edges, the ends contracted and notched, though sound and firm. Two of the lower molars, on one side, were decayed, one a bad, the other a small decay; all the others were sound. There was a peculiar bluish tint of the gums and other soft parts of the mouth; the breath bad, and indicative of some constitutional disease or disturbance, which is unusual in healthy persons. I made inquiry as to whether he had had measles, scarlatina, or any other cutaneous disease, when a child? to which he answered in the negative. He had a peculiar look about his face that I would pronounce, *after seeing his teeth*, to be the result of hereditary syphilis, or a syphilitic taint inherited. The

blood, under the microscope, gave no unusual or abnormal appearances whatever.

This man said he was stout and healthy, which leads us to conclude that he did not suffer from the taint; the appearances of the blood under the microscope would lead to the same conclusion; the bad breath being the main indication of any constitutional disturbance at present.

It will be neccessary to assign some reason for this defective enamel development. My views are these:

In the formation of the teeth, there must be a double basement, or formative membrane, situated between the dentine and enamel, at the commencement of the formative process, one process traveling inwards, the other outwards, both commencing about the same time, by consecutive improvised primordial ossifying cells, or cells that are to undergo ossification. In the enamel, all cells ossify. On the contrary, in the dentinal cells, there are two kinds—one set of semi-cartilaginous cells, called pulp cells, suffer ossification; another set of cells, which are true axis cylinder nerve fibril cells, that resist ossification, and occupy the tubuli of the dentine, ossification taking place all around each fibre, numbering, in the aggregate, millions, in a large tooth. One set of cells being made up of true nerve-fibre, wholly resist ossification, or, in other words, dentification, while the other set are more or less non-vital, and readily take on ossification. In the enamel the case is different, there being but one set of non-resistant calcigorous cells. Now, in those cases of non-developed, or imperfectly developed enamel, as described in the above cases, there must be some disturbing cause, sufficient to produce this arrestation of normal development, and necessarily caused by the disease in question. This disturbing agency I regard as an acid reaction in the enamel membrane or cells, dissolving out any lime salts that may be deposited in the enamel tissue, such as any of the acids, that contain hydrogen, which may be secreted in some way in this tissue, or in the mucus membrane immediately covering this enamel membrane.

This inherited or induced syphilis in children, whether contracted during parturition, or by nurses, or any other way, at any time previous to the development of the dental structures would, in my opinion, be sufficient cause to produce this arrestation by arresting, altogether, the enamel matrix, from want of proper germinal matter, owing to defective nutrition in the parts; or if the matrix is formed at all, fails to take on ossification, from the causes assigned above.

I know of no other satisfactory explanation, and even the one given may ultimately prove to be erroneous.

I advance the above views from my own researches and observations in this direction. The profession are deficient in data on this, as well as on many other morbid processes. I have been led to believe, from my researches, that all bone absorptions, or wasting, are the direct result of acid action. Any of the hydrogen acids are capable of removing lime salts from bones; as the bones are composed of bibasic phosphate of lime, any acid, with strong affinities, readily takes up one equivalent of the bibasic phosphate, leaving a bibasic phosphate of lime, which is an acid salt, and readily soluble in almost any liquid, and is readily washed away; the carbonate of lime being also readily decomposed by any hydrogen acid. Thus the lime is disintegrated, at the same time astoine is oxidised out same as any other low form of tissue.

There can be no other way for waste of osseous tissues. Oxygen cannot take the lime out of bones, as they are already saturated with it before uniting with the phosphoric acid and carbonic acid. In this way all ravages, including normal waste of all osseous structures, are affected. The above ideas I have long entertained, and advocated in published articles on the subject.

I saw, quite recently, another strongly-marked case of furrowed enamel, of the twelve anterior teeth, The subject, a young woman, a Creole, a dark brunette, of low origin and culture. The twelve front teeth were deeply grooved and notched, near and at their cutting edges, very similar

to the two other cases described. The countenance gave no evidence of any disease: the mouth on the contrary, gave the bad fetor, similar to the last-named case, not owing to decayed teeth. I have no doubt about her case.

I have seen many others, only less strongly marked. Such cases, even in New Orleans, are not so frequent as might be supposed.

The other day a surgeon of New Orleans showed me a genuine Hunterian chancre, to all appearances, which was caused by the blood and pus of a mortified finger, that had been crushed, of a young man, 20 years old, who, when asked, about having syphilis, denied ever having had the disease. The sore is pronounced, by a number of the ablest physicians of the place, to be a genuine chancre, having all its characteristics, which was contracted some three weeks since, showing no disposition to heal by local treatment, only by constitutional mercurialization; until the last few days, has there been any improvement. During the operation, the skin of the finger was slightly abraded, and coming in contact with the blood and pus, caused the sore in question.

Is it possible for the tissues and secretions of the human body, untainted with venereal, to become specifically poisonous, so as to inoculate itself into the healthy organism, and simulate chancre, in appearance only, or with all the attributes of the genuine disease? If not, the only conclusion left in the above case is constitutional disease, and that contrary to all the above statements, this secondary, or constitutional disease, is capable of producing the primary chancre, which would, in all probability, unless checked, pass through the usual stages and sequences. The soreness of the arm, rendering it almost useless, proves the fact that the disease was traveling into the system by slow and sure marches, unless checked. Subsequently, the young man acknowledged that he had been affected.

SYPHILITIC INFECTION FROM KISSING.

Dr. F. F. Maury (in the *Medical and Surgical Reporter*) says: "I have seen two cases—one now on hand—in my

private practice, where a patient, with mucous patches upon the lip, kissing another, developed upon the lip of the latter a hard chancre, with its attendants, of indurated base, involvement of the submaxillary lymphatic ganglions of the affected side, and a profuse secondary manifestation of roscola maculata."

ANOTHER CASE OF FURROWED ENAMEL.

A lady, about thirty years old, apparently of sound constitution, some of the back teeth decayed. The six front teeth, above and below, are croos-grooved—two grooves in each, about midway of the teeth, with great regularity and symmetry; no notching or pitting, as generally accompany such cases. I made inquiry whether she had ever had, whilst a child, any cutaneous disease, scarlet fever or measles. She replied, "nothing of the kind," which left the inference that there must have been some taint in her system. I could not detect any sign of venereal taint about her.

There may be other causes than constitutional taints, or any of the acute exanthemata, of furrowed enamel, that may be purely local, at a particular time, of dental germ formation during the developmental enamel processes, something like a stricture in the fibres of the investing membrane, about the time of hardening of enamel, from some oral irritation.

The ossification of enamel may be regarded a crystaline process, quite independent of the organic forces—a molecular process, according to a law of molecules, *i. e.*, polarity, the *primum mobile* of all crystaline processes.—*Nashville Jour. of Med. & Surg.*

ARTICLE V.

Dental Physiology.

BY HENRY S. CHASE, ST. LOUIS.

That dentition is a natural physiological process ought not to be doubted. Many, indeed I think the majority of writers on medicine, have classed it among the *causes* of in-

fantile diseases. That there are very many diseases peculiar to the period of dentition cannot be denied. But they are only so, owing to the remarkably impressible condition of the infantile vitality or constitution, just as a young and succulent vegetable growth is easier marred or injured than that which is more matured. And as the young vegetable growth more quickly recovers from mechanical injury than the older one, so do the constitutions of children more quickly recuperate after the morbid cause is removed than do those of adults.

It is not strange that these facts are so patent, when we consider the wonderful activity of the processes of Nutrition, growth and disintegration. In a normal condition the frequency of the heart's action indicating the rapidity of the sanguineous circulation, is a true index of the rapid changes taking place in the young growing tissues.

When from a sufficient cause a cell is changed from its natural physiological condition, whatever that may be, its proliferation, both as to rapidity and extent, is in proportion to the quickness of the chemico-vital changes of the individual whether he be young or old. And thus it is that the new being in its flushness of chemico-vital processes coming in contact with moibific agents inimical to health and life of older and more stable organizations, is itself easily impressed with their forms, and multiplies them with the force natural to its vitality.

On the other hand we stoutly contend that no natural physiological process in one set of organs should or does necessarily induce disease in other portions of the body which is in a natural condition.

The laws of nature are all in mutual relation or harmony, and it would be a reflection on divine wisdom to admit any proposition to the contrary. Therefore, I reiterate the fact that dentition is not necessarily a cause of disease. But the converse is true; namely, that disease is a fruitful source of mal-dentition. What is usually termed dentition is the process of Eruption or passage of the teeth through the gums.

But I think a better definition would be this, namely, *the formation, growth and eruption of the teeth.* And on this basis I make the following remarks:

The derangements of dentition commence *early* in GESTATIVE UTERINE LIFE. We may not place the period later than the fourth month, or when the dentification or calcification of the germs is fairly under way.

The foundation of mal-dentition is often laid still earlier than this, namely, at the moment when the OVUM is impressed with the vitality of the spermatozoa, and the NEW BEING is at once created, and receives its law of development at that same instant, with all its peculiarities stamped upon its yet unshapen members, subject only to modifying causes affecting nutrition. For on the physiological nutrition of the new being depends the strength, permanence, and vital forces of its individual organs.

MAL-NUTRITION depends upon

1st. The non-ingestion of proper food.

2d. The non-ingestion of sufficient food.

3d. Non-digestion or imperfect digestion.

4th. Non-assimilation, or imperfect assimilation.

The two latter are often produced by Idiopathic, or constitutional disease in the mother.

Tissues cannot be formed without material. The *mother* must provide this during the whole period of gestation and lactation, not only for her own body, but for that of her growing child. In health, nature furnishes the mother with an *extra* appetite for food, causing her to eat an extra diurnal amount, corresponding to the demands of the new being. If food of natural proportions, or that which has not been robbed of its *natural elements* is used by the mother, the desirable end will be accomplished. But if this is *not* the case; if, for instance, the *starch* of wheat is used as a factor of nutrition to the exclusion of the gluten and the inorganic elements which the whole berry contains, then all the tissues of the body must suffer.

Transformations of tissue must go on whether food is in-

gested or not; and disintegration of every tissue of every organ will daily take place in very regular and definite proportions both in conditions of nutrition and starvation.

Whatever chemical analysis proves to be the constituents of any tissue, must be furnished by the blood, or that tissue will diminish in weight, whether it be muscular, cartilaginous, osseous or other.

Starch cannot take the place of gluten, neither will soda or potassa interchange with lime.

In my Report on Dental Physiology, to the American Dental Association for the session of 1865, I endeavored to show that the fine flour of wheat is unfit for the principal food of an expectant or nursing mother, as indeed it is for any other person. I think I succeeded in proving that it is very deficient in those inorganic elements which the bones and teeth particularly demand for their formation and preservation. I also endeavored to show that the universal use of this article of diet in the United States is the *principal* cause of defective teeth in this country.

There is no *discord* in the laws of nature; for every physiological necessity there are means for its satisfaction. The Creator has placed in every variety of food the proximate elements required for the nutrition of the body. The ingenuity of man alone has sacrificed the good and the natural to the gratification of his depraved tastes. The whole brute creation obeys the laws of nature, and reaps the rewards of health.

The practical lesson which I wish to impress on the mind is this, namely: that those who intend to be parents should have their own dentures in a sound and healthy condition *before* they cause the conception of a new being. As peculiar conditions of the system are transmitted from one generation to another, parents cannot be too careful that no taint of theirs shall curse their offspring. Acting in accordance with the laws of enlightened hygiene will ensure this.

In addition to this the *constitutional* diseases which impress their types on progeny with such fearful constancy

must be cured. The most dreadful of all these is syphilis. There is none more fatal to dental nutrition and growth than this. Its unrelenting grasp holds dental development in check to the third and fourth generation. It may almost daily be seen in notched incisors, eroded enamel and defective dentine.

Mercurial disease is hardly less fatal to the teeth and causes similar pathological sequences.

Consumption, as well as the two diseases named, produces dwarfed teeth. Consumption causes pearly-looking teeth, with calcification complete. These decay readily, and cut easily with an excavator even when not decayed.

If the teeth of parents are in a healthy condition, even if many of them have been decayed and are now plugged, and the general health is good, and no constitutional taint is present in the body, there need be no fear of transmitting to the offspring the influences of imperfectly organized teeth, provided the normal acts of nutrition are not afterward thwarted by disregarding the laws of dental hygiene. To this end the mother must ingest sufficient food containing osteogenous and dental constituents in *nature's proportions* in order to furnish the child which she carries, with all its needs.

There is no mystery or difficulty about this. Excepting in substituting fine flour for that which is *unbolted* there can hardly be a mistake. Lean meats, meal of all the cereals, the legumens, garden roots, and fruits are all suitable. And then there is milk, which deserves letters of gold, cheese and butter. Fermented and spirituous liquors can add nothing unless they idiosyncronise and promote digestion and absorption. Cleanliness of the skin; purity of air; sunlight, together with exercise in the open air, become almost indispensable adjuncts to diet in dental or general hygiene in civilized life.

If the type of American teeth is ever to be improved, so that they may become a *blessing* to the majority instead of as now a curse, dental physiology must point to conception and gestation as the periods for the commencement of those important measures which are to accomplish the great work.

Here is not only legitimate work, but the *real* work to do. If "an ounce of prevention is worth more than a pound of cure," then here is the *remedy* which faithfully applied will prove a blessing to this nation, and perhaps to the world.

As gestation is as much a physiological process as sleeping or cutting teeth, there are no diseases necessarily consequent upon it. There are few ailments common to gestation, of which I will briefly speak. The first is

MORNING SICKNESS.

This is certainly not a disease, but is just as truly regarded by the mother as an ailment, at least, from which she feels that she would only be too happy to be relieved. Yet it probably is not usually cut short or cured by *medicine* without detriment to the mother, for it is undoubtedly a physiological act; a preparatory act for the better nutrition of the system. Is it not an effort of nature to prepare the body for a more perfect assimilation of food, to increase the appetite, to strengthen the powers of digestion, thereby furnishing the embryo with abundance of material for development and growth? Women in savage life are subject to this condition, so are some animals; at least I have observed it in cats and dogs. Therefore, unless this condition becomes abnormally developed, by latent constitutional psora, or bad habits, it should not be interfered with.

Constipation is another ailment common to gestation among flour eaters. Those who use unbolted wheat meal rarely suffer in this respect.

Hemorrhoids or piles is another trouble common to the same class of persons. Although in advanced stages of gestation there is a natural tendency to produce prolapsus of the large intestine, yet it does not take place where the principles of enlightened hygiene are obeyed. Piles is not an idiopathic disease, but only a symptom consequent on a disturbance in a more distant portion of the body.

A consideration of these ailments in all their bearings would carry me too far from the main subject, which is not therapeutical, but hygienic.

It is very important to secure for the expectant mother uninterrupted good health during the whole period of gestation and lactation; therefore ailments or diseases must be promptly met by all the hygienic and therapeutical means at our command.

Whenever sickness is serious enough to affect ingestion and digestion even for the space of one month it will inevitably leave its marks upon the microscopical structure of the teeth. The proximate cause is innutrition. When this takes place early in gestation, say before the fifth month, the dental germs which are in a soft and pulpy state are arrested in growth and receive an impression which often dwarfs them in size. Not only does this happen to the milk teeth, but the bulbs of the permanent ones are affected also. But the latter undoubtedly are more seriously affected after birth up to the fifth year by the causes mentioned.

It has often been observed that some children are "small of their age" up to five or six years or older, and that they afterward "take a start" and grow to the full size of womanhood or manhood which their parentage warrants. Now as teeth cannot enlarge in diameter after the calcification of the enamel and the coronal ends of the dentine tubes, they necessarily remain of the diminutive size which they are forced to take by starvation. And thus it is that we so often observe in the mouths of adults teeth which properly correspond in size to those of the milk teeth. Especially is this to be observed in lateral incisors, canines and bicuspids. I would suggest that the contour lines or shadings so often seen in the dentine of these teeth are the result of arrested development, showing the size and shape of the bulbs at the time. Sometimes there are several of these in one tooth, corresponding to successive arrests of growth.

The lacunæ or interglobular spaces in dentine are very likely the result of arrested development in the dentinal corpuscles, from a lack of nutrition also.

That these effects may be afterward remedied by good health and a better nutritive supply I do not doubt. But

the importance of the mother's health for the perfect development and growth of the dental tissues is hereby shown.

Dental calcification is a long process, and continues from the fourth month of intra-uterine existence far beyond adult life. It is seen not only in the increasing hardness of the teeth as age progresses, but also in the actual transformation of the dental pulp into a substance resembling bone. A *calcification* in fact of its connective tissue.

At the period when the new being is ushered into a new world no teeth are yet erupted, for none are fully formed, and therefore nature kindly furnishes the child with a pabulum for its nourishment, requiring neither mastication nor effort of the will to fit it for its digestion.

Notwithstanding the changed relations of mother and child as regards position and mode of nourishment, yet the fact still remains as plain as before that her blood should be a magazine plentifully supplied with lime salts for the continued development and perfection of the dental organs. From birth until weaning is the period in which the *drain on the mother's blood* is most severe, and as lactation goes on, the teeth become rapidly diseased in many cases, and caries of the dentine is more or less developed according to the present and previous hygienic habits, and health of the mother. The activity of dental decay in these unfavorable cases is in strong contrast with that of unmarried women and men. Fractures of the bones also heal with difficulty owing to the diminished quantity of lime phosphate in the blood. Not only do the osseous and dental tissues of the mother suffer, but the whole system is under a general *malaise* consequent on the lack of these salts in *every* tissue of the body. The brain, which uses up so much phosphoric acid in the operations of the mind, is dull and feeble, and the muscles pale and flabby, and incapable of their normal work.

At this period it is customary to apply to the dentist for professional aid, only however to solicit his *surgical* and *mechanical* skill; *rarely* to ask advice to hygiene. Who is to

blame? Without doubt the dental profession which has not yet come up to the standard of physiological science which the age demands.

When we have all learned the necessities of a mother famishing for the lack of the necessary elements of nutrition, mothers themselves will become aware of their needs through our instructions at the dental chair, the social circle and the public press, and will apply to those for aid whose duty it is to render it.

A mother in this condition should not be sent away with patched teeth merely, but with that knowledge which shall gradually build up again her disintegrated tissues as rapidly as physiological laws will admit. This is not impracticable, it has often been done.

To be Continued.

The Southern Dental Association.

The fifth annual meeting of this association will be held in Baltimore, commencing on the last Tuesday in July next. This promises to be one of the most interesting meetings ever held, and we trust it will be well attended by the Southern members of the profession. Efforts are now being made to obtain reduced fare on all railroads in connection with the Baltimore and Ohio, due notice of which will be given.

EDITORIAL, ETC.

A Model Hospital.—Mr. C. C. Fulton, of Baltimore, now in Europe, sends the following description of the General Hospital of Vienna, which, in view of the fact that the Johns Hopkins' Hospital, soon to be erected in Baltimore, will be the largest and most complete in America, will prove interesting to our readers, as they will understand by this account of the Vienna institution what a magnificent hospital our city will in a short time possess, through the liberality of one of her most prominent citizens:

"This building was originally built for and used as an almshouse, under the reign of Leopold I., finished in 1769, and turned into a hospital during the reign of Joseph II., in 1784, who paid the cost of the alteration out of his private means. It is the largest hospital in Europe, and at that time already had room for two thousand beds. The entire building is of brick, two stories high. In 1832 the obstetrical wards were added, which is three stories high, and cost 496,831 florins. In 1862 the new pathological institute was finished, in which the post mortems are made. In this building all the clinical lectures are held, and in a few years it is expected that it will be entirely turned over to the University.

At present clinical instruction is given by 20 professors, 25 private docents, as they are called here, and 16 assistants. All persons (except children under five years of age, for whom there is a children's hospital separate from the above,) are admitted.

The grounds have a frontage on three streets. They consist of a series of buildings, divided by thirteen courts, with fountains in the centre, and cover a space of 26,718 square degrees. The buildings alone cover a space of 7,350 square degrees. Both the old building and the addition are built in the shape of parallelograms.

The smallest ward contains 14,495 cubic feet, the largest

49,187 cubic feet. There are 143 wards in the building, capable of accommodating 2,018 patients, for whom there are 220 nurses, mostly females, or about one to every ten patients.

For the purposes of clinical instruction, the following number of beds are at the disposal of the Medical Faculty, exclusive of clinical wards: 2 medical departments, clinical wards 50 beds; 1 mental disease department, clinical wards 50 beds; 2 surgical disease departments, clinical wards 50 beds; 2 eye disease departments, clinical wards 30 beds; 2 syphilis disease departments, clinical wards 52 beds; 1 skin disease department, clinical wards 47 beds; 1 throat disease department, clinical wards 18 beds; 2 ear disease departments, clinical wards 19 beds. All the rest of the cases of the institution are treated by a number of primararyte, as they are called, but who give no clinical instruction.

In the year 1871, 21,147 patients were admitted into the hospital, and 2,932 died. In connection with the regular clinics there is also an out-door system of prescribing, thousands being treated in this way annually.

The pathological-anatomical college, a beautiful building, two stories high, adjoining the Hospital, contains on the first floor rooms for post-mortem purposes. It will be necessary to premise that all persons dying in the Hospital before their bodies are delivered to their friends must be subjected to a post-mortem examination. If the friends are not able to pay the expenses of a funeral, then the body goes to the dissecting room during the lecture season (ten months in the year,) and is afterwards buried at the expense of the State. These post-mortem examinations have produced a "Rokitansky, a Virchow, and a Rindfleisch." The corpse, two hours after death, is brought into this building, and into a large room filled with beds and blankets, in one of which it is placed and covered. On the wall alongside of each bed is an alarm clock, with a string which is attached to the wrist of the body. The least movement that is made sets the bell in motion, and alongside the room is another in which there are always two men with restoratives at hand in case they should ever be needed. In the afternoon the bodies are examined by the assistants of the Professor of Pathological Anatomy, and after he [who, by the way, is sworn for this purpose] has declared them dead, they are undressed and placed in another room on iron

stretchers. The next morning at 8 o'clock the post-mortem is made, and in the afternoon the body is turned over to the friends.

On this floor are three separate rooms for post-mortems, one for the judicial post-mortems made by Prof. Rokitansy himself, who is the sworn officer of the Government for this purpose. All cases of suspicious death, suicides, &c., in the city are sent to the Pathological building, and the post-mortem examinations are made in this room by the above mentioned Professor. Then there is the clinical post-mortem room, where the bodies are examined of those who have died in the clinical wards, generally in the presence of the Professor who treated them, and his students. In the last room is held the post-mortem examinations for the other departments of the Hospital.

Beside these rooms on the first floor are the working rooms of the Professors of Surgery and Medicine, and in the second story are the chemico-pathological rooms, rooms of the Professor of Experimental Pathology, lecture room for the pathological anatomy, and last, but most important, the pathological museum of Prof. Rokitansy, the finest in the world, containing 5,000 of the rarest specimens.

The number of physicians attached to the Hospital is eleven professors, twelve department physicians, who have charge of divisions not at all in connection with the professors, sixteen assistants to the professors, and forty assistants to the department physicians—with the Pathological Anatomy Professor and assistants makes a sum total of eighty-four physicians. There are also four priests who reside in the institution.

Every patient, as soon as he is admitted into the Hospital, receives the regular Hospital dress, and his own clothes, after being numbered, are locked up in a separate building by an officer appointed for this purpose. The cost of treatment is about 5 florins per week. If the patient is poor, it is charged to the village or city where he resides; if a servant or apprentice, it is charged to the employer.

In the Eye Departments there are now two professors, and in the hall there will be three full clinics on this branch in operation. Professor Von Ault, who holds the highest position in Germany, has besides the regular clinic, the out-door patients

daily from 11 to 12, the cases annually treated in this way being over 5,000. The assistants give private courses on the various branches of this specialty ; altogether about ten of these courses are given, each lasting about six weeks, and the same rule holds good in the other branches. For opportunities for studying, this Hospital stands unequalled.

In the Obstetrical Department, one of which is for students and one for midwifes, there are annually about eight to nine thousand births, of this number from two to three hundred are legitimate children—comment is unnecessary.

There were upwards of fifty American physicians here the past winter, the most of them from New York and Massachusetts, a number of them being professors of some of our medical schools."

The Discoverer of Anæsthesia.- The following appears in the June 21st number of the *Medical and Surgical Reporter*, which has always earnestly advocated and defended the just claims of Dr. Horace Wells, a practicing dentist :—

The eleventh day of December, 1844, was an era, and a very important one, in the history of surgery. On that day Horace Wells, of Hartford, Conn., for the first time made practical demonstrations of the application of anæsthetics for the purpose of subduing pain under surgical operations. While under the influence of nitrous oxide gas, he had a sound tooth extracted. He remained under the influence of the gas some time after, and immediately upon recovering from it threw up his arms and exclaimed, " A new era in tooth pulling ! It did not hurt me more than the prick of a pin. It is the greatest discovery ever made !" From this time the principle of anæsthesia became an established one in surgery, and by degrees came into general use. Wells pursued his experiments with nitrous oxide, ether, and other agents, with an enthusiasm which eventually cost him his life. Finding that others were seeking to rob him of the credit of his great discovery, he became disgusted, disappointed, and dispirited. He then went to New York to lay his claims as the discoverer of anæsthesia before the profession of the great metropolis. Soon after his arrival there he manifested symptoms of mental aberration, and on the 24th of January, 1848, in a fit of

madness, ended his life with his own hands. He thus left his family unprovided for, and an open field for the unscrupulous to poach upon to rob him ot his well-earned honors. To the discredit of the medical profession, many of them were for a time led astray by the specious representations of these parties. But the sober second thought of the profession has become enlisted on behalf of the memory of the unfortunate Wells, and such men as the late Sir James Y. Simpson, Storer, Sims, Doremus, Hamilton, Squibb, and many others of the leading minds of the profession, are using their influence to do justice to the memory of the real discoverer of the application of anæsthesia in surgical operations.

Expression was given to these sentiments at a large and enthusiastic meeting in New York on the 21st of May. The meeting was addressed by Drs. Marion Sims, Ogden Doremus, Frank H. Hamilton, and others. We welcome any effort to do justice to the memory of one whose discovery, on the 11th of December, 1844, soon deprived surgical operations of their terror, and proved such a boon to suffering humanity, and such an invaluable aid to the surgeon in the use of surgical instruments. We feel proud of the fact that for twenty-five years the *Medical and Surgical Reporter* has constantly and earnestly advocated and defended the claims of Wells. May they yet receive that full and free recognition at the hands of the public and the general government which they undoubtedly deserve.

In a communication from Dr Henry J. Bigelow, of Boston, published in a New York paper, that gentleman, although his object is to support the claim of Morton, is compelled to admit the priority of Wells' practical application of anæsthesia for surgical purposes, though he endeavors to belittle his achievements, and claims that Wells abandoned the use of anæsthetics.

In reply to this, Dr. G. Q. Colton very emphatically upsets the theory of the Wells' abandonment. "We have," he says, "the sworn testimony of about forty of the most respectable citizens of Hartford, that during the years 1845 and 1846 Wells extracted teeth for them without pain, using the gas as an anæsthetic. He was in constant use of the gas for about eighteen months, when his health gave way, and he went to Europe. Even in Europe he did not abandon his discovery, for he presented his claims to the Academy of Sciences in Paris, and that

institution, in recognition of the services, conferred upon him the title of M. D.

"As soon as Wells returned to this country he resumed the use of the gas, and continued it until his death, which occurred on the 24th of January, 1848.

"But he met the most determined and bitter opposition from all quarters. It was at that time too much to believe that the inhalation of so little gas or vapor would destroy the pain of a surgical operation! Dr. Wells did all that a man could do, while he lived, to prove to the world the value of his discovery. Should he be deprived of the honor of the discovery because the public were incredulous and repudiated his claims?

"Wells died before the merits of the gas were generally recognized. After his death Dr. Morton set up the claim that nitrous oxide was not an anæsthetic, and therefore that Wells had discovered nothing! No one had used the gas to produce anæsthesia save Wells, and Morton was enabled to gain a general assent to the position he took, namely, that nitrous oxide not being an anæsthetic, therefore he, Morton, was the discoverer of anæsthesia! If at that time and during the lifetime of Mr. Wells the gas had proved to be what it really is, and what I have demonstrated it to be, the best and safest anæsthetic known, we never should have heard of Morton as the discoverer of anæsthesia.

"When I revived the use of the gas in 1863, I had this general incredulity respecting its powers to contend with. I was met on all sides by the assertion that Wells had tried the gas and it had proved a failure. I expended eight thousand dollars the first year in advertising, advocating, and defending it; and in all this time did not realize a dollar of profit from my business. Is it any wonder that poor Wells, who had no money to spend, should encounter opposition and discouragement in its first introduction?

"It should be remembered that Wells' first experiment, for which I gave him the gas, was on the 11th of December, 1844, and that the first experiment by Morton was on the 30th of September, 1846; also, that Morton was stimulated to this experiment by information derived from Wells, and newspaper notices of Wells' operations.

"In view of all these facts," says Dr. Colton, "how can any one hesitate to award the honor of the discovery of anæsthesia to Dr. Wells?"

BIBLIOGRAPHICAL.

A System of Dental Surgery.—By John Tomes, F. R. S., and Charles S. Tomes, M. A. Second edition, revised and enlarged. Publishers, Lindsay & Blakiston, Philadelphia.

It is with pleasure that we announce the second edition of a work which nearly fifteen years ago was presented to the profession by an English author, who has acquired a world-wide reputation for his scientific researches, and his ability as a leading member of our profession in Europe.

While the text of this second edition has been considerably increased, the bulk of the volume has been lessened, owing to smaller type being used. Some sixty new illustrations have been added to the present edition, making in all the number of 263, and 748 pages. The chapters devoted to neuralgia, dentigerous cysts, odontomes, secondary affections resulting from the irritation set up by dental disease, and other shorter sections are entirely new. The chapter on dental caries, however, with the exception of slight additions and alterations remains much the same as in the first edition, but an appendix is added which gives a summary of the conclusions which the author draws from recent investigations.

Acknowledgment is made of the assistance derived from Heath's "Diseases and Injuries of the Jaws," Wedl's "Pathology of the Teeth," and the "Atlas" of Profs. Heider and Wedl.

As regards the theory of enamel formation, and causes of dental caries, the author's opinions conflict with those generally accepted in this country. We recommend the work as a useful addition to dental literature.

A Manual of Dental Mechanics.—By Oakley Coales, L. R C. S. Publishers, Lindsay & Blakiston, Philadelphia.

This is the first edition of another English work, containing two hundred and eighty-three pages, and one hundred and forty illustrations, printed in large type and on heavy paper. The author in his pr eface states that this work makes no pretence to originality, but is intended for the student rather than the prac-

titioner. The information it imparts is of a practical nature, relating to dental mechanics, and excluding all that is of doubtful value or merely theoretical. To his American brethren the author expresses his deep obligations for valuable investigations and new facts in the Science of Dentistry.

Section I. treats of the Preparation of the Mouth for Artificial Teeth. Section II. On Taking Impressions. Section III. Various Modes of Applying Heat in the Laboratory. Section IV. Casting in Plaster of Paris and Metal. Section V. Precious Metals used in Dentistry. Section VI. Making Gold Plates. Section VII. Various Forms of Porcelain used in Mechanical Dentistry. Section VIII. Pivot Teeth. Section IX. Choosing and Adjusting Mineral Teeth. Section X. The Vulcanite Base. Section XI. The Celluloid Base. Section XII. Treatment of Deformities of the Mouth. Appendix, containing receipts for making gold plate and solder.

On Strictures of the Urethra.—Results of operations with the dilating urethrotome, with cases. By F. N. Otis, M. D. Publishers, D. Appleton & Co., New York, 1873.

MONTHLY SUMMARY.

A Remedy for Hæmoptysis.—Dr. Holden desires to call the attention of the profession to a method of treatment of hæmoptysis, which, while most simple and efficacious, he has not seen described by any one; namely, the throwing of the atomized vapor of a saturated solution of gallic acid directly into the mouth and throat. He has repeatedly found the most gratifying success to follow this treatment at once, even in cases of profuse hæmorrhage; unlike other styptics thus administered, it quiets the spasmodic cough, which seems the direct result of the presence of the blood, requires but a moment to prepare, and aside from its efficacy, it inspires immediately the confidence of the patient. For about two years he has adopted this method, and has been

surprised that no similar experience has found its way into the medical journals. His habit has been to have an atomizer and bottle gallic acid always at hand, and when summoned hastily to mix the acid in a tumbler of cold water, and use even without waiting for the excess of acid to subside. It has proved successful in several cases where blood was streaming from the mouth with every expiration.—*Med. Record.*

Vehicle for Chloral Hydrate.—J. G. Plumer, in *Lond. Pharm. Jour. and Trans.*, recommends as the best vehicle for administering chloral hydrate, the syrups flor. aurantii of the B. P. We have ourselves found nothing to answer better than essence of peppermint for disguising the peculiarly acid and nauseous taste of the drug.—*Detroit Review of Medicine.*

Nervousness.—Dr. Henry Madden, in an article on "Nervousness," takes exceptions to Dr. Bennett, who calls the sufferings of the nervous "*supposed* pains," and says "it is a distinct begging of the whole question." He proves by handy, but nevertheless true, illustrations, that the sufferings of this class of invalids are to them as severe "as are the rackings and tortures of the martyr broken on the wheel." "The difference is, that while a strong man's balance remains unmoved under a pressure of many pounds, the sensitive invalid is borne down by the weight of a feather," and in many cases that feather is necessary to do it. To further illustrate, he says: "Man's ingenuity has already enabled him to weigh the one-thousandth of a grain, to measure the one-ten-thousandth of an inch, to mark the one-ten-thousandth of a minute, to detect the one-thousandth of a degree of heat, but the unfortunate individual who feels all too keenly the hundredth part of what a strong man calls pain, is laughed at, and assured that 'it's all fancy,' and that it can easily be got rid of, if the patient will only make up his mind to forget it." To prove how the mind influences the body, he speaks of the effect of education on the special senses, and says this education is due to the "exercise of two especial functions of the mind—viz: *fixed attention* and *predominant ideas.*" To a morbidly fixed condition, or "unconscious cerebration," as Professor Laycock terms it, he thinks many of the sufferings of nervous persons are due. Indeed, he says that "the condition called nervousness may be traced to a *functional disturbance of that part of the nervous centers which presides over attention.*"—*Med. Investigator.*

Oatmeal, Bone and Muscle.—Liebig has shown that oatmeal is almost as nutritious as the very best English beef, and that it

is richer than wheaten bread in the elements that go to form bone and muscle. Professor Forbes, of Edinburg, during some twenty years, measured the breadth and height, and also tested the strength of both the arms and loins of the students in the University—a very numerous class, and of various nationalities, drawn to Edinburg by the fame of his teaching. He found that, in height, breadth of chest and shoulders, and strength of arms and loins, the Belgians were at the bottom of the list; a little above them the French; very much higher, the English; the highest of all, the Scotch and Scotch-Irish, from Ulster, who, like the natives of Scotland, are fed, in their early years, with at least one meal a day of good milk and good oatmeal porridge. A very good drink is made by putting about two spoonsful of the meal into a tumbler of water. The Western hunters and trappers consider it the best of drinks, as it is at once nourishing, unstimulating and satisfying.—*Med. Investigator.*

Suppression of Perspiration.—Socoloff gives an abstract of the results which follow varnishing the skin and suppression of the cutaneous secretion:

1. A few hours before the death of the animals so treated, clonic and tetanic spasms appear in various groups of muscles, while the temperature in the rectum sinks in a marked degree.
2. Enveloping the animals in wadding did not serve to raise the temperature or arrest the fatal result.
3. Respiration of oxygen proved ineffectual to resuscitate the animals.
4. In the stomach ulcers were observed, the result of deep extravasations.
5. Albumen appeared in the urine very soon after the skin was varnished.
6. In all cases a diffuse parenchymatous inflammation of the kidneys was observed—sometimes swelling of the cells, and sometimes fatty degeneration. This result was independent of the nature of the varnish used, whether turpentine varnish, or gum.

Lang (*Arch. d. Heilkunde*, xiii., pp. 277-287, 1872) investigates the causes of death when the skin has been varnished. In addition to other phenomena he found an hour or two after death "tripple phosphate crystals" in various parts of the body, and some of the uriniferous tubules blocked with a finely granular dark mass. He thinks that the triple phosphate crystals are the result of decomposition of urea, and that the cause of death is uræmia.—*Jour. Anat. and Phys.*, November, 1872; from *Centralblatt*, No. 44, 1872.—*Am. Jour. Med.*

Diarrhœa in Teething.—In a clinical lecture "On the Primary Dentition of Children," by Francis Minot, M. D., Harvard (*Bos-*

ton Medical and Surgical Journal, January 2, 1873,) in speaking of the diarrhœa complicating teething during hot weather, recommends the common chalk mixture, with the addition of one-fourth part tincture of kino, which increases its astringency, and also keeps it from turning sour in hot weather. If the diarrhœa be not stopped by this mixture, one drop of laudanum may be added to a dose, but not oftener than three times a day, in children under two years old. Diarrhœa is most apt to attack children who are brought up on the bottle; hence, if the case be urgent and does not yield to treatment, a wet nurse should be procured if possible. When this cannot be done, he would strongly recommend the method of preparing the milk with arrow-root and gelatine, found in the treatise on "Diseases of Children," by Dr. Meigs and Pepper. Brandy is very useful to a teething child exhausted by diarrhœa, which should be given once in three or four hours, or oftener in urgent cases. The dose is ordinarily from five to twenty-five drops, given in milk; but if there be much prostration the physician need not fear to increase the amount.—*Canada Med. & Surg. Journal.*

The Odor of Orris Root.—This is supposed to depend on an essential oil. At a pharmaceutical meeting, in England, a British pharmaceutist, Mr. Umney, said that he had had considerable experience in regard to orris, and had no doubts in regard to the existence of an essential oil, representing the odor of the root. He had distilled many tons of the latter, and found the yield to be about one part from one thousand. The oil obtained resembled cocoa butter, and communicated an exceedingly powerful odor to alcohol. It was very expensive—more so, perhaps, than otto of roses. It was suggested by one of the members present that this oil might be the orris camphor described by Gmelin. Prof. Wayne thought the odorous principle depended more upon the soft resin than upon the oil, but this does not appear to have been the case with the oil described by Mr. Umney.—*Medical and Surgical Reporter.*

Death During Etherization.—In the *Boston Medical and Surg. Journal* of May 29, Dr. Cabot reports the following:

"An old man, weak, but not excessively so, had undergone an operation which lasted three-quarters of an hour. He was removed from the operating room, and the usual orders to watch him were given. Five hours afterwards he had a violent attack of dyspnœa, and died. Food was found in one of the bronchial tube.

"He also referred to a similar case which had occurred some time ago. A fat woman, while lying on her back under ether, vomited, and some of the vomit getting into the trachea killed her."—*Med Times.*

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ARTICLE I.

California State Dental Association.

Pursuant to adjournment, the fourth annual session of the California State Dental Association convened at St. Andrew's Hall, Young Men's Christian Association Building, San Francisco, May 20th, 1873, at 10 o'clock A. M., and was called to order by the President, Wm. Dutch, D. D. S.

Prayer by Rev. Dr. Cox, of San Francisco.

Officers all present except Vice-President S. M. Harris, who was absent on account of illness.

New Members.—During the session which continued four days, the following named gentlemen were admitted to active membership:

J. W. Winter, Alex. Warner, Jr., D. D. S., C. W. Richards, D. J. Nis, W. H. Stanley, J. B. Beers, T. H. Furgerson, D. D. S., C. H. Fuller and A. B. Wood, of San Francisco; G. C. Hoadley, of San Jose; F. H. Hubbard, M. D., of Sacramento; J. J. Dyar, of Santa Cruz; D. W. Powers, of Oakland; and A. Cornwall, of Virginia City, Nevada.

Honorary Members.—Dr. O. D. Munson, E. S. Belden, M. D., of San Francisco; and B. S. Codman, of Boston, Massachusetts.

Essays were read as follows:

Requisites of the Dentist. By W. J. Prather.

Circulation of the Blood. By H. Austin.

The Mouth, its Structure and Function. By R. Cutlar.

Operative Dentistry. By J. W. Myres.

Causes and Treatment of Offensive Breath. By Max Sichel.

Dental Ethics. By F. E. Bunnell.

Reports of Standing Committees.—Reports were received from Drs. Menefee, Bush and McCowen, of Committee on Mechanical Dentistry; Dennis, on Operative Dentistry; and S. E. Knowles, on Dental Pathology and Surgery.

Special Committees.—The Legislative Committee recommended a bill similar to the Ohio law, giving members of the profession, now residents of the State, two years to prepare for an examination. Report adopted and committee instructed to use all legitimate means to secure its passage at next session of the Legislature.

The Revision Committee reported a revised Constitution, By-Laws, Code of Ethics, etc., which were adopted. The Code of Ethics is the same as that of the American Dental Association.

The Barnum Testimonial Committee accompanied their report with a magnificent testimonial; which will be presented to Dr. Barnum at the next session of the American Dental Association; therefore I refrain from giving a description of it here: although as marked by the committee, "it is a paltry gift to one who has proven himself a public benefactor by bestowing such a noble *free gift* upon the profession, when he had a fortune within his reach had he patented his invention. Paltry though it be, it is one that he will be proud of, and it will reflect credit upon our Association."

Dental College.—President Dutch, in his annual address, said, "It is evident to us all that we need on the Pacific coast a school of instruction for those who would qualify themselves for the practice of dentistry; a school where the

science and the art, the theory and the practice of dentistry may be acquired, and the power of publishing to the world, as an authority to be respected, the proficiency of those who have been thoroughly taught, as by the giving of diplomas." He also recommended the selection of eight from our number, who might be deemed the best qualified, and who were willing to take upon themselves such a responsibility, requesting them to organize from among themselves, as far as they can, a dental college, affiliating with the University of California, or some other city organization, for the purpose of conferring the degree of D. D. S.; or, failing in such satisfactory affiliation, then asking the Legislature to confer the power on the college itself; and that you give such an organization all the support you can, individually and collectively."

Prof. Gillman, President of the University of California, having been invited, addressed the Association on the above subject. He spoke of the University as an "institution of learning established by the State on foundations which were laid by private devotions in the days or Argonauts, who believed in the wisdom which was better than gold. It has been endowed by the National Government with magnificent land grants, and received from the State, generous donations and a comprehensive charter. It is a university of the nineteenth century, open without money and without price to students of every State and country, designed to promote every branch of liberal culture." He would be glad if in the organization of a dental school in connection with the University, they could rely upon the co-operation of the California State Dental Association; all the authorities of the University would rejoice at suggestions and help and counsel from members of this Society.

The Professor's address was received with applause, and he concluded by saying that he had "always dreaded meeting a single gentleman of our profession, and dreaded much more coming into the hands of thirty or forty;" but hoped from the reception given him, that he would be able to re-

port that we were united, and would be found co-operating with the University in the interests of science and humanity.

A committee of five was appointed to confer with the Board of Regents relative to the matter, and further consideration of it postponed until 10.30 o'clock next day, when the committee reported the following resolutions, which were unanimously adopted.

Resolved, that this Association receives with unqualified satisfaction the assurance that our most cherished hopes are to be realized through the wisdom and liberality of the Board of Regents of the University of California, in their proposed establishment of a dental college.

Resolved, that we approve of and recommend the following *curriculum* of instruction in the college:—1. General Anatomy and Surgery. 2. Physiology. 3. Materia Medica and Therapeutics. 4. Chemistry and Toxicology. 5. Special Anatomy and Surgery. 6. Operative Dentistry and Pathology. 7. Dental Prosthesis and Metallurgy. 8. Institutes of Dental Science. 9. Demonstrators of Operative Dentistry. 10. Demonstrators of Dental Prosthesis. 11. Course of Clinical Lectures. 12. Board of Examiners.

Resolved, that the Association endorse and recommend the following named gentlemen as proper persons to fill the special chairs above designated:—Drs. Wm. Dutch, S. W. Dennis, C. C. Knowles, Wm. J. Younger, H. E. Knox, S. E. Knowles, H. Austin and J. J. Menefee.

Resolved, that an Advisory Committee of five be appointed and empowered to act with the Advisory Committee of the Board of Regents in carrying into effect all necessary details of organization.

The president appointed Drs. Cutlar, Birge, Lundbory, Bunnell and Coyswell, to act as Advisory Committee.

Clinics were given during the session by Drs. Dutch, Dennis, Knowles and Younger.

Discussions.—The several reports and essays were thoroughly discussed, and as soon as published, each dental journal will be furnished a copy, so that they can select

therefrom any matter that they may deem new or important to their readers and the profession generally.

Officers.—President, Dr. C. C. Knowles, San Francisco; Vice-President, Dr. J. J. Menefee, San Jose; Secretary, Dr. H. J. Plomteaux, Woodland; Corresponding Secretary, Dr. H. E. Knox, San Francisco; Treasurer, H. Austin, San Francisco; Librarian, J. J. Birge, San Francisco.

Standing Committees were appointed on Dental Pathology and Surgery, Dental Therapeutics, Dental Chemistry, Operative Dentistry, Mechanical Dentistry, Dental Histology and Microscopy, Dental Literature and Education, Publication, and Executive.

Theses.—The President made the following assignments: An Inquiry into the Causes and Treatment of Degeneracy of Children's Teeth, Dr. D. M. Hughes. The Secretions of the Mouth, Considered in their Normal and Abnormal Characteristics, Dr. T. H. Ferguson. Pregnancy as Affecting the Teeth, Dr. A. Cornwall. The Inter-relations of Dentistry and Medicine, Dr. J. A. W. Lundbory. Extraction of Teeth, Dr. F. M. Shields. Dental Education, Dr. H. J. Plomteaux.

The next annual session will be held in San Francisco, commencing second Tuesday in June, 1874, at 10 A. M.

Resolutions appropriate to the memory of Dr. E. O. Belle, deceased since our last annual session, were reported and adopted by standing vote.

Mr. F. P. Forbes, of San Francisco, presented the Association, for the President's use, an elegant marble slab and gavel, which was received with applause, and a vote of thanks extended the donor.

The able and efficient administration of President Dutch was highly endorsed by the Association.

The session lasted four days, and with short intermissions, was at work from 10 o'clock A. M. to 10 o'clock P. M.

After adjournment we proceeded to Martin's restaurant and partook of an excellent collation given us by the San Francisco Dental Association.

H. J. Plomteaux, *Secretary.*

ARTICLE II.

Nitrous Oxide Experiments.

Continued from May Number, 1872.

BY S. P. CUTLER, M. D., D. D. S.

Prof. Barker, in his work on Nitrous Oxide, page 50, says: "My opinion is, that the chief danger in nitrous oxide consists in the rapid formation of carbonic acid gas, which is due to the excessive disintegration and waste that continue while the system is under its influences." Same page, says: "If a mouse is placed under a receiver, and allowed to breathe nothing but nitrous oxide, it will die, and on opening the heart and blood vessels, the blood will be found to present a dark color, usually present when death results from asphyxia."

Page 55, author says: "The danger of nitrous oxide consists in the fact that it increases oxidation of the fluids and solids of the body, and also acts as a stimulant to the brain and nervous system; where there exists any predisposition to congestion or inflammation, the administration of nitrous oxide may develop this latent tendency, and a fatal result ensue."

On the contrary, my experiments fully demonstrate the fact that the gas retards oxidation throughout the body, rather than increasing it; which fact will be made more manifest further on. The gas produces symptoms closely allied to catalepsy if not identical; that disease though not dangerous, is not pleasant to witness. The same might be said of the gas. The above writer, says: "The gas increases oxidation of the fluids and solids of the body, and acts as a stimulant to the brain and nervous system." When every symptom speaks to the contrary, as in cases of catalepsy, a want of oxidation is everywhere manifest.

In a pamphlet on nitrous oxide, by S. R. Divine, M. D., page 23, says: "Nitrous oxide supports respiration, and exalts the functions of the animal system. It is composed of the same elements that constitute the air we breathe, and hence must be most nearly normal. It produces *carbonic*

acid by decomposition in the circulation; but this is not a foreign substance, for the air generates it there also." Same page, says: "I will venture a theory as to the primary cause of anæsthesia. I have supposed it to be the introduction into the blood of a foreign substance (or in the case of nitrous oxide, carbonic acid, beyond the normal quantity.) Possibly it is essential that the substance be carbonaceous, as is the case directly or indirectly, with all known anæsthetics. I am of opinion that nitrous oxide owes its anæsthetic effect to the formation of carbonic acid in the circulation faster than it is eliminated.

Page 19, says: "*Expired air* contains about on an average, three and a half per cent. of carbonic acid by measure. Twenty per cent. of carbonic acid in air, renders it destructive to life. Such a mixture will first cause drowsiness, then total loss of muscular power, afterwards insensibility, coma and death. There can be no doubt that in some cases where a small quantity of gas has been used, that the patients have been asphyxiated with carbonic acid, instead of *anæsthetized* with nitrous oxide. The quantity of *nitrous oxide* that is converted into carbonic acid in the blood, is probably quite small, but still the expirations contain a larger amount of carbonic acid than when air is used."

Do we know precisely the functions gas performs in its rounds of the circulation? Does this gas enter into the red corpuscles? If so, by what law of affinity does it enter them, and by what law leaves them again, either in the systemic capillaries or lungs on the return currents. Who shall answer this important question?

The same might be asked of chloroform and all other anæsthetic vapors. None of these vapors perform vital functions; if so, anæsthesia could not be superinduced; their functions in the economy must be regarded as anti-vital in all respects; a retrograde action. They replace simple air, take the place of it, and arrest oxidation throughout the organism in proportion to the extent it is carried.

Any innocuous vapor, as nitrogen or hydrogen, might be

used with somewhat similar results; in fact the gases have been inhaled with impunity. Do we know whether or not any oxidation takes place with the oxygen that is already in the system when the gas or any other vapor is used after the blood becomes saturated with it?

We have good reasons to believe the negative of this question, from all the symptoms produced, such as loss of sensation, muscular power and consciousness, blueness of skin lips, difficult respiration, cadaverous expression, and all other attendant phenomena.

None of these are normal signs; none of these are healthful signs; on the contrary morbid indications—signs none of us like to witness; they are startling, and awaken fears in the most courageous *gastodian.*

When an individual is under asphyxia he is insensible and unconscious of pain, from the arrestation of a chief vital function; that of atmospherical or normal respiration, coma and syncope, which are the effects of the arrestation of the other two vital functions, or their suspension, also renders the person unconscious to pain from traumatic injuries. When oxidation in the blood and other tissues becomes arrested from any cause, nervous transmission to and from the brain become in proportion arrested, more especially to the brain, which carries sensation. It seems that these nervous currents, the result of oxidation, simultaneously in every cell of the entire body, are indispensable to the conveyance of pain from any point to the brain.

From *a priori* conclusion, we infer that transmission becomes arrested, or if actually taking place, there is no consciousness or mental recognition. Volition, also, and consciousness succumbs in proportion to the extent it is carried. The same would equally apply to both syncope and coma. Sensibility, volition and consciousness, are in exact proportion to the extent of the effect attained. Again, when vital air is excluded, and something else substituted in its stead, there must necessarily be a retrogradence of vital functions, *paripassu* taking place, co-extensive with the time and com-

pleteness of effect. Cause and effect have to go hand in hand; as the cause becomes more absolute, so also does the effect become more absolute.

Richardson says, of his ether spray producing local anæsthesia, "that sensation is cut off from the brain, from the point chilled, by virtue of the cold arresting nervous transmission." This is simply the effect, the true cause being the suspension of oxidation of the chilled point, and in consequence, no nerve forces being generated at such point, no transmission takes place. Any intermediate available point where an operation is to be performed, sprayed and chilled over the track of an afferent nerve, provided all circuitous routes could be guarded, we would also prevent the function of pain. But such cases are rare and impracticable.

All oxidation ceases at the freezing point, either in or out of the body, and gradually diminishes as that point is reached; hence, a person with a frost bit finger could suffer amputation without pain, as there is neither oxidation or transmission. Wherever there is pain felt, there is undue oxidation either from disease or injury of a part taking place. This undue oxidation causes undue heat, the normal amount of magnetic force is not evolved, as the injured or weakened part gives oxidation an undue preponderence over nutrition. An injured or weakened part generates too much heat, and too little nervous magnetic force, as the one is rapidly converted into the other under certain conditions. Oxidation causes molecular disturbance, *i. e.*, motion among molecules. This motion in one case means heat, in the other, magnetism: motion being the resultant not the cause *per se*.

From second report of the Odontological Society of Great Britain, and the committee of management of the Dental Hospital of London, to inquire into the value and advantages of protoxide of nitrogen as an anæsthetic in surgical operations—this, their final report, is to be found in the January and February Numbers of the *Missouri Dental Journal*—I will make a few quotations: February No., 1873, p.

42, says: "Independently of the above, the following objections may be urged against the view that nitrous oxide is decomposed in the blood. 1. The stability of the compound it not being decomposed by the ordinary deoxidizing agent. 2. The fact that when breathed, the quantity of the exhaled gases is much smaller than the quantity inhaled, which would not be the case were it decomposed in the lungs or blood vessels; for nitrous oxide being composed of two volumes of nitrogen, combined with one volume of oxygen, but occupying only the space of two volumes: any obstruction of oxygen would not be attended with any diminution of bulk. 3. If nitrous oxide be decomposed in the blood, in what manner can the liberated nitrogen, which must assume the gaseous form,—none, I think will venture to dispute—effect its escape through the walls of the blood vessels of the lungs? Yet its presence in the blood in the form of a gas, would we know, rapidly prove fatal to the individual.

I am, &c.,

A. Coleman.

"From these experiments so scientifically and carefully conducted, the majority of your committee are of opinion with Dr. Frankland and Mr. Coleman, that this agent can not produce its anæsthetic effect from being decomposed in the lungs or blood, as has been supposed by some; but are inclined to believe that it produces its effect by preventing oxidation of the blood, an opinion receiving support from the fact that anæsthesia may be produced by the inhalation of such gases as hydrogen, nitrogen, carburetted gases, &c."

From the above experiments we have the hitherto most satisfactory evidence and proof of the permanency of the gas, during its perigrinations through the circulation of the blood, at least for a short time, though decomposition may, and undoubtedly does after some time has elapsed, take place to a certain limited extent, otherwise animals immersed into the gas would sooner die. My own experiments with fresh meat, would favor this conclusion, also with mice.

Carpenter, in his Human Physiology, p. 313, edition 1865, says: "When nitrogen or hydrogen is breathed for any length of time, death results from the deprivation of oxygen, rather than from any deleterious influences which these gases themselves exert." On same page, speaking of the respiration of pure oxygen, says: "At first the rapidity of the pulse and the number of respirations are increased, and the animal appears to suffer little or no inconvenience for an hour; but symptoms of coma then gradually develop themselves, and death ensues in ten or twelve hours. If the animals be removed into the air before the insensibility is complete, they quickly recover. When the body is examined, the heart is seen beating strongly, while the diaphragm is motionless; the whole blood in the veins, as well as in the arteries, is of a bright scarlet color, and the blood coagulates with remarkable rapidity."

From what Mr. Carpenter says, we may conclude at least that nitrous gas is not at once decomposed in the blood, and rapid oxidation following as a natural sequence. If so, this blueness so often witnessed, would not take place; in fact, the symptoms of nitrous gas and oxygen, when breathed, are exactly opposite in the chief physiological effects on the body, and the experiments as reported by the committee above given, are also confirmatory of these conclusions.

The effects of the gas seems to be a downward grade instead of an upward one—a letting down of vital energy, a decline of power. Mr. Richardson's chilling process is simply to arrest a retarded oxidation, thereby lessening function and pain, pain being a morbid or abnormal function, and not a physiological process proper, hence pathological. I must regard the effect of any anæsthetic as pathological, and not a physiological effect; one pathological effect preventing another, must be the gas motto, (like *similia similibus curantur*, only in an opposite direction.)

Rapid oxidation going on in the economy, would necessarily increase traumatic pain, as in case of lancing a boil, felon, or cutting into any inflamed part; where there is un-

due oxidation going on, the nerves suffer more or less from *dialysis* of the part where there is an undue oxidation taking place, inflammation sooner or later follows, then too much heat is developed and too little magnetism, hence a disturbance in the *thermo magnetic* nerves, or currents, resulting in pain at the point or points.

There has been a great deal said and written on the subject of the safety of using gas indiscriminately for minor operations, when there is no danger from the shock of the operation even apprehended, still some deaths have occurred, and more will occur of necessity if the use of the gas is persevered in by the dental profession so unanimously as now practiced.

We naturally conclude from what Mr. Carpenter says concerning the inhalation of oxygen gas, that from the rapid oxidation of blood and tissues, a necessarily rapid formation of carbonic acid, an intense blueness of skin would follow, which, however, is not the case; on the contrary a florid condition throughout prevails. This is quite different from the effects of nitrous gas, which produces a cadaverous blueness so often witnessed in sudden death, as drowning and other causes of strangulation, and other modes of death. This blueness so far as it goes, means cadaver or death, nothing short, a tendency to decomposition, and suspension of nutrition, a loss of balance in the upward and downward forces: why? Because there is an abnormal condition.

An argument so often made use of by the advocates of the safety of gas, is that it does not contain any foreign body, only atmospherical elements. This is true, though not a very valid argument, as nitric acid, and all the other compounds of these two gases contain simply atmospherical elements, whose vapors inhaled, would *scuttle* the air passages like a ladle of melted mettle poured down the wind pipe.

Why write or say anything against nitrous gas, or any other mischievous humbug. People gulp the gas, and willingly have their mouths and pockets robbed, at the same

time say it is a good thing, and let their teeth decay *ad lib-itum*, in consequence of gas; who can stop it? Still the world wags on, as this is a progressive age. It is a pity '*Josiah*' hasn't the same monopoly on gas that he has on rubber, so as to be able to fight it out on that line, right or wrong. If the use of gas could be made the exception and not the rule, it would be quite a different thing altogether. The abuse is what I object to, not its legitimate and discriminating use, which is all well enough.

ARTICLE III.

Porcelain Impression Cups for Taking Impressions of the Teeth.

BY B. M. WILKERSON, D. D. S., M. D.

Porcelain impression cups are little used, notwithstanding they are in many cases superior to the metal. They are much more attractive to the eye of the patient, as the practitioner has no trouble to keep them beautifully clean. They are excellent for taking partial, as well as full impressions; and especially where there are undercuts, as the cup will leave the plaster (after it has set,) with little force of the hand; then the operator can easily break away the impression, replace it in the cup, and run his model. When it is desirable to build up the arch with wax, and when there are undercuts requiring the removal of the cup before the impression, it is best not to stick it tightly, nor cover too much of the palatine surface of the cup, as it will be difficult to remove from the impression. The cup can be made as deep as desired by extending the rim with sheet wax. The cups *must* be made *perfectly smooth*, with *no undercuts*. They are of sufficient strength for all practical purposes. A thorough trial by a neat operator will insure their use a permanency in his practice, and give general satisfaction to his patients.

MONTHLY SUMMARY.

On the use of Artificial Respiration and Transfusion as a means of Preserving Life.—Dr. T. Lauder Brunton, of St. Bartholomew's Hospital, presents in an interesting and valuable paper, a review of various important physiological experiments and observations, and show how they may be utilized in the treatment of disease. Quoting Huxley, he says, "Life has but two legs to stand upon, the lung and the heart; for death through the brain is always the effect of the secondary action of the injury to that organ upon the lungs or the heart." The experiments of the Abbe Fontana, Legallois, and Brown-Sequard have shown that headless trunks, isolated portions of the body, or the head alone, may be kept alive, or even restored to life, by a proper supply of oxygenated blood; and not only have nerves and muscles been made to retain vitality, but livers have secreted bile and lung excreted carbonic acid hours after they were excised from the body.

A point of great practical importance is that the parts do not all die at the same time, and, as the brain and spinal cord generally die first, the heart may pulsate regularly after all respiratory movements have ceased and consciousness and reflex action are entirely lost. If, under such circumstances, respiration be kept up artificially, the heart continues beating, and the circulation of arterial blood through the brain may gradually restore its power, respiration recommence, and life be securely re-established. Schiff's experiments have demonstrated that animals may be kept alive, after almost entire destruction of the medulla, or after the injection of water under high pressure into the cranial cavity. Hence it is evident that we may hope for the best results from the use of artificial respiration in some of those cases of apoplexy where an extravasion almost instantly arrests the respiratory movements, either directly, by destroying a part of the medulla, or indirectly, by causing compression of the brain.

In poisoning by wooara, hydrocyanic acid, strychnia, etc., as well as by the bites of snakes, artificial respiration is invaluable as the only means of affording time for the excretion of the toxic agent. Where the poison exists in large quantities, or is excreted very slowly, requiring hours or even days before it can be

got rid of, the obvious plan of treatment would be to remove the poison along with the blood in which it is circulating, instead of waiting for its slow removal by the emunctories; and here transfusion comes to the aid of artificial respiration.

A New Method for Healing Ulcers—(Dr. Nussbaum, *Wien. Med. Presse*, May 4, 1873).—The author claims to have sucessfully treated upwards of sixty cases of chronic, extensive and otherwise intractable leg-ulcers, by the following simple procedure. It is at least worthy of a trial. The patient is first narcotized, and then around the ulcer of the leg or foot, a finger's breadth from its margin, an incision extending down to the fasciæ is made; numerous blood-vessels are divided, and a severe hemorrhage ensues unless a fine pledget of lint be packed into the cut and the entire ulcer strongly compressed. The packing with lint is also necessary to prevent union of the cut edges by the following day. Upon the second day the bandage and lint are removed from them; until a cure is affected a simple water-dressing is applied.

The author states that an astonishing change can be seen, even in the first twenty-four hours; the ulcer, which yesterday threw off quarts of thin, offensive, ichorous pus, furnishes to-day not more than a tablespoonful of thick, non-offensive, healthy pus. The old ulcer becomes rapidly smaller, healing from the margin towards the centre, and is healed in a short time, but the cut is changed into a broad circular sore, which also speedily cicatrizes.

The great diminution of the secretion, and other favorable changes occurring in the ulcer, find an explanation from the fact that the circumcision has divided dozens of large, abnormally widened blood-vessels. Time is thus given for the lessened nutritive material, which previously was carried off by the excessive secretion, to be transformed into cells and connective tissue; in other words, granulations are formed, which fill up and heal the deep ulcer.

Without claiming this as a radical method, the author assures us that the cure is much more rapid, and the cicatrix becomes more elastic and resisting than in the ordinary means applied, which usually require so much time that the patients depart with half-cured ulcers, soon to find themselves in their previous deplorable condition.—*Med. Times.*

Neuralgia and Sciatica Cured by Turpentine—Turpentine Pearls.—Doctor Martinet, in a memoir presented by him to the Faculty of Medicine, affirms that he has cured fifty-eight cases of neuralgia and sciatica out of seventy, by the use of the essence of turpentine. The great efficacy of this agent is not to be

doubted in the above named affections; and what is remarkable, the benefit is almost always felt from the first doses. But this medicine has such a disagreeable odor, such a harsh and pungent taste, that it is quite impossible to take it pure. Dr. Clertan has contrived to enclose it in very thin and transparent gelatine, in the form of little globules, of the size of peas, to which he has given the name of turpentine pearls. Dr. Clertan's "turpentine pearls" are as readily swallowed in a little water as pills. This agreeable form has made the essence of turpentine quite popular; and now there is not a physician (so says the announcement) in France who does not resort to turpentine pearls in the treatment of neuralgia and sciatica. Trosseau always prescribes turpentine in this form.—*Richmond and Louisville Med. Jour.*

The Physiology of The Nervous System.—The review of "Fournié on the Nervous System," in the last number of *The Journal of Psychological Medicine*, brings out the following arguments: 1st. The possibility of establishing the physiology of the nervous system upon a natural basis. 2d. To determine the nature and functions of the nervous system. 3d. The number and classification of the intrinsic functions and the functions that compose the nervous system. These subjoined facts are noted by Fournié: That the function of the cerebral powers of relation, the cerebral function of reproduction and nutrition, represent all the possible transformation produced on the brain in functional movements. That the brain furnishes a power that controls organic life. This he calls "incitation motrice."

This "incitation motrice" is the functional product of the brain, and is also given: 1st. To the apparatus of relation. 2d. To the organ of nutrition. 3d. To the organ of reproduction. But at the same time that it gives its produced function the brain does not cease to be a living special organ; that is to say, an organ perceiving and recollecting.

Fatal Poisoning from Carbolic Acid.—A woman in Louisville, Ky., had a mammary tumor excised. Four days afterwards her nurse gave her a tablespoonfull of carbolic acid, diluted with an ounce of water. She complained immediately of its burning, and the nurse tried to provoke vomiting, without success. In less than ten minutes she was unconscious, pupils contracted and insensible, respiration 50, pulse 150, clammy perspiration. Death in two hours.—*Am. Practitioner.*

THE RUBBER QUESTION.*

IN ORDER to show the present state of the litigation under the Cummings Patent, we have procured and give below the bill, answer, and replication in one of the several suits now pending in this district.

We have selected a case begun since the decision of the Supreme Court dismissing the Gardner Appeal, in order to show what issues remain open in consequence of that decision.

SAMUEL S. WHITE.

UNITED STATES CIRCUIT COURT.
Eastern District of Pennsylvania.
IN EQUITY.

To the Honorable the Justices of the Circuit Court of the United States for the Third Circuit, within and for the Eastern District of Pennsylvania, sitting in Equity.

THE Goodyear Dental Vulcanite Company, a corporation established by law of the State of New York, and Josiah Bacon, of Boston, Massachusetts, and a citizen of the State of Massachusetts, bring this their bill against William H. Gates, of the City and County of Philadelphia, dentist, and a citizen of the State of Pennsylvania.

*DR. S. S. WHITE has kindly furnished us with advance sheets of the *Dental Cosmos*, in order that we may give our readers the earliest information of the progress of the suits in the Eastern District of Pennsylvania.—[ED.]

And, thereupon, your orators complain and say, that heretofore, to wit, before the seventh day of June, in the year eighteen hundred and sixty-four, one John A. Cummings, who was then a citizen of the United States, being the original and first inventor of a certain new and useful improvement in artificial gums and palates, not at that time in public use, nor on sale with his consent or allowance for more than two years, made application in due form of law to the government of the United States for its letters-patent for such improvement; upon which application such proceedings were had that, on the said seventh day of June, letters-patent of the United States, dated the said seventh day of June, signed by the Secretary of the Interior, and countersigned and sealed with the seal of the Patent Office, by the Commissioner of Patents, were issued and delivered to the said Cummings, for the said invention, entitled an "Improvement in artificial gums and palates," whereby there was granted to the said Cummings, his heirs, administrators, or assigns, for the term of seventeen years from the said date thereof, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvement, as in and by a certified copy of the said letters-patent now in court produced, and shown to your honors, will more fully appear.

And your orators further show unto your honors, that afterward, to wit, on the thirteenth day of July, A. D. 1864, by certain deeds of assignment duly executed and recorded in the United States Patent Office, all right, title, and interest in the said letters-patent, and the invention and improvement secured thereby, became vested in the Dental Vulcanite Company, a corporation established by law of Massachusetts, as by the said deeds of assignment, or certified copies thereof, with the endorsements of the recording thereon, now produced and shown to your honors, will more fully appear.

And your orators further show unto your honors, that the said Dental Vulcanite Company, after such assignment to them, surrendered their aforesaid patent, according to law, on account of a defective specification; and a new patent was duly issued to them on the tenth day of January, 1865, for the same invention, in accordance with their corrected description and specifi-

cation, whereby was granted and secured to the said Dental Vulcanite Company and their successors and assigns, for the full term of seventeen years from the said seventh day of June, 1864, the full and exclusive right and liberty of making, constructing, using, and vending to others to be used, the said improvements therein described and claimed, and hard rubber plates embracing the same, as in and by said reissued letters-patent, or a certified copy thereof, here in court to be produced, will more fully appear.

And your orators further show unto your honors, that afterward, to wit, on the twenty-first day of March, 1865, these last named letters-patent were, according to law, surrendered by the said Dental Vulcanite Company, and canceled on account of defects still discovered in the specification, and a new patent was duly issued, bearing said last-named date, in accordance with their corrected description and specification, and for the same improvements, whereby was granted and secured to the said Dental Vulcanite Company and their successors and assigns, for the full term of seventeen years from the said seventh day of June, 1864, the full and exclusive right and liberty of making, constructing, using and vending to others to be used, the said improvements therein specified and claimed, and hard rubber-plates embracing the same, as in and by said second reissued patent, or a certified copy thereof, here in court to be produced, will more fully appear.

And your orators further show, that on the seventeenth day of July, A. D. 1866, the said Dental Vulcanite Company, by a certain deed of assignment of that date, here in court to be produced, did sell and assign to your orator, Josiah Bacon, of Boston, Massachusetts, the said letters-patent and all the rights thereby vested, together with the right to sue for and collect to his own use all damages for past infringements thereon, and that said assignment was made in trust for certain persons then associated together with intent to form the corporation which is your orator in this bill, and in contemplation of the formation of such corporation, and that such associates did afterward form and are now members of such corporation.

And your orators further show unto your honors, that your orator, the said Bacon, on or about the seventh day of January,

1868, by his deed of that date, here in court to be produced, in pursuance of said trust assigned to your orators, the said Goodyear Dental Vulcanite Company, the said letters-patent, and all rights and privileges under the same, and also the right to demand, sue for, and collect to their own use, all damages at law and profits in equity for past infringements of said letters-patent; but your orators, the said Goodyear Dental Vulcanite Company, submit that they are entitled in equity to recover such profits by reason of the said Bacon's holding of said patent having been in trust as aforesaid, as well as because they are assignees of all said Bacon's right to recover such profits.

And your orators further show unto your honors, that the said Cummings, his mesne assignees, and your orators have always, since the grant of the said letters-patent, and during the time they each owned the same respectively, and in the exercise of the full and exclusive right and liberty so granted as aforesaid, made, used, and vended to others to be used, the said improvement so patented, and have had and maintained, until the infringement hereafter complained of, exclusive possession of the said improvement and invention, under and by virtue of said letters-patent, and have never acquiesced in any invasion or infringement of their said rights.

And your orators further show unto your honors, that since the date of the said letters-patent, more than five thousand dentists, within the limits of the United States, have submitted to the claims of your orators and their assignors under said letters-patent, and have taken licenses to use the said improvement under the same.

And your orators further show unto your honors, that said Dental Vulcanite Company filed their bill of complaint against one Isaac J. Wetherbee on the twenty-fifth day of October, 1864, in the Circuit Court for the District of Massachusetts, praying for an injunction and other relief in equity against said Wetherbee, for infringement of said patent, to which bill of complaint the said Wetherbee filed his answer, denying the validity of said letters-patent, and alleging, among other defenses, that said Cummings was not the original and first inventor thereof, and setting up that many other persons, both in Europe and in the United States, used and practiced said in-

vention before said Cummings's alleged invention. Whereupon such proceedings were had, that evidence was taken by both parties upon all the points at issue, and the case was fully heard and argued before the said Circuit Court, and thereupon, to wit, at the May term, 1866, of said Circuit Court, said court rendered its decision upon all the points at issue, and ordered judgment and a final decree in favor of the complainants, and a perpetual injunction to be issued against said Wetherbee, enjoining him from infringing upon said letters-patent.

And your orators further show unto your honors, that in the latter part of 1866, a large number of dentists combined together to resist said patent in the district of Maryland, and test cases were made on bills filed on November 23, 1866, in the United States Circuit Court for said district, by Josiah Bacon *vs.* Hugh Arthur and Robert Arthur, and by Josiah Bacon *vs.* Adalbert Volck, and a full hearing was had on motions for interlocutory injunctions, on which the validity of said patent was fully and exhaustively argued by counsel for the respective parties, and on the 10th day of December 1866, the court, Giles, J., rendered an opinion in favor of complainants, and decided to grant the injunctions. And thereupon such proceedings were had that decrees were made in favor of complainants in both of said suits, and said injunctions were made perpetual.

And your orators further show unto your honors, that on the 14th day of April, 1868, a bill was filed in the United States Circuit Court for the Western District of Pennsylvania, by the complainants in this cause against Charles Sill and Milton E. Gillespie, for infringement of said letters-patent; and, after full argument by counsel for the respective parties, on a motion for an interlocutory injunction in said suit, the said court, McCandless, J., entered a decision in favor of complainants, and granted the said injunctions, on the 18th day of May, 1868. And thereupon such proceedings were had that on the 13th day of November, 1868, a decree in favor of the complainants was made in said suit, and said injunction was made perpetual.

And your orators further show unto your honors, that one Benoni E. Gardner, a citizen of the State of Rhode Island, infringed upon said patent, whereupon your orators filed their bill of complaint against said Gardner on the 16th day of Septem-

ber, 1868, in the United States Circuit Court for the District of Rhode Island, praying for an injunction and other relief in equity against said Gardner; to which said bill of complaint said Gardner filed his answer, denying the validity of said letters-patent, and alleging, among other defences, that said Cummings was not the original and first inventor of said improvement, and setting up that many other persons had used and practiced the said improvement before the invention thereof by said Cummings, as claimed and set forth in said bill of complaint. And thereupon evidence was fully and exhaustively taken by both parties upon all the points at issue, and the cause was brought to a final hearing on its merits, and fully argued before said court, before Hon. Nathan Clifford, Judge, and thereupon at the June term, 1870, the judgment of said court was pronounced in favor of the complainants on all the points at issue, and a decree was entered, directing among other things that a perpetual injunction be issued against said Gardner, enjoining him from infringing upon said letters-patent. And thereupon the said Benoni E. Gardner appealed from said decree to the Supreme Court of the United States, and the said Supreme Court, after full argument by counsel for both parties, rendered its decision, affirming said decree, on the 6th day of May, 1872.

And your orators further show unto your honors, that the *respondent* herein, having full knowledge of the premises, and in violation of your orators' exclusive right and privilege as aforesaid, and utterly disregarding the same, *has*, since the 17th day of July, 1866, and before and since the said assignment of the said letters-patent to your orators, the Goodyear Dental Vulcanite Company, without the license of your orators, at Philadelphia, Pennsylvania, and at various other places in the United States, manufactured, used, and sold, and still *continues* to manufacture, use, and sell, many artificial gums and palates, embracing the improvement and invention described in said letters-patent, and so secured to your orators—how many, your orators are unable to say, but pray that the *respondent* may discover and set forth in *his* answer to this bill.

And your orators further show unto your honors, that they will be subject to great and irreparable injury, unless they shall obtain from your honors the relief hereby sought.

To the end, therefore, that the said *defendant* may, if *he* can, show why your orators should not have the relief hereby prayed, and may upon .... *oath* ....and according to the best and utmost of *his* ....knowledge, remembrance, and belief, full, true, direct, and perfect answer make to all and singular the matters hereinbefore stated and charged, as fully and particularly as if the same were hereinafter repeated, and *he* .... thereunto distinctly interrogated, and more especially that *he* .... may answer and set forth,—

1. Whether *he has* not made, or caused to be made, or used, or sold, dental plates made wholly or partly of hard rubber or vulcanite, since the 17th day of July, 1866, and what number thereof, according to the best of *his* knowledge, information, and belief, as near as *he* can approximate the same?

2. Whether *he has* not made, or caused to be made, or used, or sold, dental plates made wholly or partly of hard rubber or vulcanite, since the first day of January last, and what number thereof, according to the best of *his* knowledge, information, and belief, as near as *he* can approximate the same?

3. Whether *he has* not made, or caused to be made, or used, or sold, dental plates made wholly or partly of hard rubber or vulcanite, since the 17th day of July, 1866, in each of the successive years ending on the 31st days of December thereof respectively, specifying separately each of the said years in which any of said dental plates were so made, used, or sold, and what number thereof in each of said years respectively, according to the best of *his* knowledge, information, and belief, as near as *he* can approximate the same?

4. Whether *he has* not received money or property directly or indirectly from the manufacture, use, or sale, since the 17th day of July, 1866, of dental plates made wholly or partly of hard rubber or vulcanite, and what amount of such money or property *he has* received, or *is* entitled to receive from such manufacture, use, or sale, since the 17th day of July, 1866, specifying the amount received in each of the successive years ending on the 31st day of December thereof respectively, and also the amount received since the first day of

January last, according to the best of *his* knowledge, information, and belief, as near as he can approximate the same?

5. Whether *he has* not now on hand a quantity, and how much of any substance composed wholly or partly of gum, or rubber prepared to be manufactured into plates, or gums of hard rubber, or vulcanite?

6. Whether *he has* not now on hand many, and how many dental plates, or gums made wholly or partly of hard rubber or vulcanite?

And that the said *respondent* may answer the premises, and may be decreed to account for and pay over to your orators all such gains and profits as have accrued to *him* from *his* said infringement by making and selling such artificial gums and palates, and also to pay to your orators, in addition to said profits, the damages which have been sustained by your orators by reason of said infringement, and that *he* may be restrained by an injunction issuing out of this honorable court, from making, using, or vending to others to be used, any artificial gums or palates, embracing the improvement so secured to your orators as aforesaid, and also that an injunction issue so restraining the *defendant* pending this cause, and that the said rubber or vulcanite, and the artificial gums and palates so manufactured by *him* of said rubber or vulcanite, and now in possession of said *respondent*, may be destroyed or delivered up to your orators, and for such other and further relief as the nature of the case may require, and to your honors may seem meet.

May it please your honors to grant unto your orators not only a writ of injunction conformable to the prayer of this bill, but also the writ of subpœna directed to said William H. Gates, commanding him to appear and answer to this bill of complaint, and to do and receive what to your honors shall seem meet.

And your orators will ever pray.

GOODYEAR DENTAL VULCANITE COMPANY,
By its Treasurer, Josiah Bacon.

J. E. SHAW, *Complainant's Solicitor.* } JOSIAH BACON.
GEO. HARDING, *Of Counsel.* }

UNITED STATES OF AMERICA, }
DISTRICT OF MASSACHUSETTS. } *ss.*

At Boston, in the county of Suffolk, in said District, this twenty-seventh day of February, A. D. 1873, personally appeared Josiah Bacon, who signs the foregoing bill, and made oath that he has read the same, and understands the same and the contents thereof; and that all the matters therein stated as of the knowledge of the complainants, are to his knowledge true, and as to all other matters therein stated, he verily believes them to be true.

Before me,

{ NOTARIAL SEAL. } E. ERNEST CADUC, *Notary Public.*

A true copy.

SAMUEL BELL, *Clerk Circuit Court U. S., Eastern District of Pennsylvania.*

UNITED STATES CIRCUIT COURT,
Eastern District of Pennsylvania.
IN EQUITY.

THE GOODYEAR DENTAL VULCANITE COMPANY, AND JOSIAH BACON,
vs.
WILLIAM H. GATES.
} No. 3, April Session, 1873.

THE answer of William H. Gates, of Philadelphia, Pennsylvania, defendant, to the bill of complaint of the Goodyear Dental Vulcanite Company, and Josiah Bacon, complainants.

This defendant, now and at all times hereafter, saving and reserving to himself all and all manner of benefit or advantage of exception and otherwise, which can or may be had or taken to the manifold errors, uncertainties, imperfections, and insufficiencies in the said bill of complaint contained, for answer thereto, or to so much and such parts thereof as this defendant is advised it is material or necessary for him to make answer unto, answering, saith:

That he is not informed, otherwise than by the allegations in said bill of complaint, and does not know whether the said complainant, The Goodyear Dental Vulcanite Company, is a corporation established by law of the State of New York; and that due proof thereof may be made in this cause, he denies that it is such corporation or so established as alleged in said bill of complaint.

This defendant is informed and believes, and thereupon admits, that before the seventh day of June, in the year one thousand eight hundred and sixty-four, to wit, on or about the twenty-fifth day of March, in said year one thousand eight hundred and sixty-four, one John A. Cummings, who was then a citizen of the United States, made application to the Government of the United States for its letters-patent for a certain alleged new and useful improvement in artificial gums and plates, upon which application such proceedings were had, that on the seventh day of June, in said year one thousand eight hundred and sixty-four, letters-patent of the United States, numbered forty-three thousand and nine (43,009), dated the said seventh day of June, signed by the Secretary of the Interior, and countersigned by the Commissioner of Patents, and sealed with the seal of the Patent Office, were issued and delivered to the said Cummings for the said alleged improvement.

But this defendant, upon information and belief, denies that said Cummings was the original and first inventor of said alleged improvement; he denies that said alleged invention was not at the time of said Cummings's application for said letters-patent in public use and on sale; he denies that it had not been at that time in public use or on sale with his consent or allowance more than two years; and he denies that said Cummings or his assigns have any right to the exclusive use of said alleged improvement.

And this defendant further says upon information and belief, that prior to the said seventh day of June, in the year one thousand eight hundred and sixty-four, the said Cummings had by an instrument of writing, under seal, duly executed and delivered, and dated on or about the first day of March, in said year one thousand eight hundred and sixty-four, assigned,

sold, set over, and conveyed unto G. H. P. Flagg and H. D. Osgood, both of Boston, Massachusetts, one undivided quarter of all his right and interest in said alleged invention, and in the said letters-patent issued upon the application therefor, as aforesaid, as, recourse being had to said instrument of writing, as recorded in the United States Patent Office, will more fully and at large appear, and as will fully appear recourse being had to a duly authenticated copy of said instrument, or to said instrument of writing itself, which this defendant is informed and believes is in the possession or under the control of this complainant, Josiah Bacon, and which instrument this defendant therefore prays said Bacon may be required to produce and file in this court, to be used on any examination of witnesses in this cause, and at the hearing thereof, as this defendant may be advised. And this defendant further says upon information and belief, that prior to the said seventh day of June, in the year one thousand eight hundred and sixty-four, the said Cummings had by an instrument of writing, under seal, duly executed and delivered, and dated on or about the sixteenth day of May, in said year one thousand eight hundred and sixty-four, assigned, sold, set over, and conveyed to Joseph Gavett, of Boston, Massachusetts, one undivided eighth part of all his right or property in said alleged invention, and in the said letters-patent issued upon the application therefor, as aforesaid, as will fully appear, recourse being had to said instrument of writing, which this defendant is informed and believes has never been recorded in the United States Patent Office, but which, as he is informed and believes, has been and now is in the possession of or under the control of this complainant, Josiah Bacon, and which instrument of writing this defendant therefore prays said Bacon may be required to produce and file in this court, to be used on any examination of witnesses in this cause, and at the hearing thereof, as this defendant may be advised.

As to the alleged deeds of assignment mentioned in said bill, whereby, on the thirteenth of July, in the year one thousand eight hundred and sixty-four, the said letters-patent and the alleged invention and improvements secured thereby are alleged to have become vested in the Dental Vulcanite Company named in said bill, this defendant is not otherwise informed,

and has no knowledge, and he therefore denies the allegations thereof contained in said bill, and leaves the complainants to make proof thereof as they may be advised.

And further answering, this defendant is informed and believes, and thereupon admits, that the aforesaid letters-patent numbered forty-three thousand and nine (43,009) were on or about the twenty-first day of December in said year, one thousand eight hundred and sixty-four, surrendered and canceled, and a new patent numbered (reissue) one thousand eight hundred and forty-eight (1,848) issued on the tenth day of January, in the year one thousand eight hundred and sixty-five, to the Dental Vulcanite Company; but this defendant upon information and belief denies all and singular the other allegations in said bill contained, respecting the surrender of said original letters-patent and the reissue thereof, under date of January tenth, A. D. 1865.

And further answering, this defendant is informed and believes, and thereupon admits, that after said tenth day of January, in the year one thousand eight hundred and sixty-five,—to wit, on or about the twenty-seventh day of February, in the year one thousand eight hundred and sixty-five,—the aforesaid reissued letters-patent numbered one thousand eight hundred and forty-eight were surrendered and canceled, and he so as aforesaid admits that a new patent was thereupon issued to the Dental Vulcanite Company, bearing date the twenty-first day of March, in said year one thousand eight hundred and sixty-five, which new patent is numbered (reissue) one thousand nine hundred and four; but he so as aforesaid denies that said last-mentioned reissue was for the same alleged improvement, and he further denies that thereby was secured to said Dental Vulcanite Company, their successors and assigns, the exclusive right and liberty of making, constructing, using, and vending to others to be used, the alleged improvements therein specified and claimed, and hard rubber plates embracing the same.

And further answering, this defendant says that he is not informed otherwise than by the allegations in said bill of complaint, and does not know whether the said Dental Vulcanite Company did on the seventeenth day of July, A. D. 1866, by a deed of assignment of that date, sell and assign to this com-

plainant, Josiah Bacon, in trust for others, the said letters-patent and all the rights thereby vested, together with the right to sue for and collect to his own use all damages for past infringements thereon; and therefore, and in order that due proof may be made in that behalf as the complainants may be advised, this defendant denies each and every of the allegations in said bill contained respecting such alleged assignment.

And further answering, this defendant says that he is not informed otherwise than by the allegations in said bill of complaint, and does not know whether the said Bacon, on or about the seventh day of January, 1868, by his deed of that date, assigned to this complainant, the Goodyear Dental Vulcanite Company, the said letters-patent and all rights and privileges under the same, and also the right to sue for and collect to their own use all damages at law and profits in equity for past infringement of said letters-patent; and therefore, and in order that due proof may be made in that behalf as the complainants may be advised, this defendant denies each and every of the allegations in said bill contained respecting such alleged assignment.

And this defendant denies, upon information and advice, that said complainant, the Goodyear Dental Vulcanite Company, are entitled in equity to recover profits, as alleged in the said bill of complaint, by reason of said Bacon's alleged holding of said patent having been in trust, as alleged in said bill, as well as because they are alleged assignees of all said Bacon's alleged right to recover such profits.

And further answering, this defendant, upon information and belief, denies that the said Cummings, his mesne assignees, and these complainants, have always, since the grant of said letters-patent and during the time they each owned the same respectively, and in the exercise of the alleged right and liberty so granted as aforesaid, made, used, and vended to others to be used, the said alleged improvement so patented as aforesaid; or have had and maintained, until the infringement complained of in said bill, exclusive possession of said alleged improvement and invention under and by virtue of said letters-patent; and he so as aforesaid further denies that they have never acquiesced in any invasion or infringement of their said alleged rights.

And further answering upon information and belief, this defendant further denies that since the date of the said letters-patent, more than five thousand dentists within the limits of the United States have submitted to the claims of these complainants and their assignors under said letters-patent, and have taken licenses to use the said alleged improvement.

And this defendant, further answering, says that he is informed and believes, and thereupon admits, that on or about the twenty-fifth day of October, A. D. 1864, the said Dental Vulcanite Company filed their bill of complaint against one Isaac J. Wetherbee in the United States Circuit Court for the District of Massachusetts, praying for an injunction and other relief in equity against said Wetherbee for alleged infringement of said original letters-patent numbered forty-three thousand and nine, and dated June 7, A. D. 1864, as aforesaid; that the said Wetherbee filed his answer to said bill of complaint, denying the validity of said letters-patent, and alleging, among other defenses, that said Cummings was not the original and first inventor of the improvement patented to him in said original letters-patent No. 43,009, and setting up that many other persons, both in Europe and in the United States, used and practiced said invention before said Cummings's alleged invention.

And this defendant, further answering upon information and belief, says that upon the filing of said answer to said bill by said Wetherbee, or very soon thereafter, the said letters-patent were surrendered and canceled and reissued under date of January 10, 1865, and this reissue again was thereafter surrendered and canceled and reissued under date of March 21, A. D. 1865, as hereinbefore set forth. That after said several reissues of said letters-patent, said cause was proceeded in between said Dental Vulcanite Company and said Wetherbee, but the pleadings therein on the part of said Wetherbee were in the final decision of said suit adjudged irregular; and under such adjudication many of the defenses set up by said Wetherbee were excluded from consideration by said court; others of the defenses set up by said Wetherbee were avoided by the reissue of said letters-patent after said Wetherbee had filed his answer to said bill of complaint; others of said Wetherbee's defenses in said suit were not supplemented by proof, but were waived or aban-

doned, and the only points at issue on the final hearing of said cause did not involve the defenses hereinafter made by this defendant, nor include the proofs upon which this defendant relies; and the decree alleged in the bill of complaint as rendered in said suit was not based upon correct conclusions of law or fact, and is therefore not in anywise conclusive as to the validity of the said reissued letters-patent set out in the bill of complaint in this cause, nor as to the rights of the complainants alleged therein.

And further answering, this defendant says that respecting the alleged proceedings in the United States Circuit Court for the District of Maryland by Josiah Bacon against Hugh Arthur and Robert Arthur and against Adalbert Volck, and respecting the alleged proceedings in the United States Circuit Court for the Western District of Pennsylvania against Sill and Gillespie, mentioned in said bill of complaint, this defendant has no knowledge or information other than is afforded by the said bill of complaint itself, save that he is informed and believes that all of said proceedings were taken and had under or in connection with the letters-patent granted to Nelson Goodyear, May 6, 1851, as reissued in 1858, and said suits were not, nor was any or either of them, brought to final hearing, nor any proofs taken therein after the interlocutory injunctions were granted, as alleged in said bill of complaint; and he is further informed and believes that said suits were not contested suits, and did not raise any inquiry into the validity of the letters-patent set out in the bill of complaint in this cause, and that said suits were compromised, or the defenses thereof abandoned, in view of their connection with the aforesaid letters-patent of Nelson Goodyear; and this defendant is advised and believes, and thereupon avers, that said proceedings are not in anywise conclusive as to the validity of the said reissued letters-patent set out in the bill of complaint in this cause, nor as to the rights of the complainants alleged therein.

And further answering, this defendant says that respecting the proceedings in the United States Circuit Court for the District of Rhode Island, by these complainants, The Goodyear Dental Vulcanite Company and Josiah Bacon, against Benoni E. Gardner, as alleged in said bill of complaint, and respecting

the appeal taken from the decree of said Circuit Court to the Supreme Court of the United States, and the affirmance of said decree by said Supreme Court on the 6th day of May, 1872, he is informed and believes and thereupon avers that said proceedings in said suit in the Circuit Court of Rhode Island, and in the said Supreme Conrt of the United States, were collusive, fraudulent, and false; that there was no dispute between said complainants and said Gardner, in said Circuit Court nor in said Supreme Court; that the decree in said Circuit Court was not and was not intended to be enforced, but that before and at the date of such decree said Gardner was protected against the same by agreements made in that behalf between these complainants and one J. B. Newbrough; that the injunction awarded against said Gardner was not and was not intended to be enforced; that the costs in said suit and on said appeal were paid by these complainants; that both sides of said cause were argued, at the fraudulent and collusive hearing thereof before Mr. Justice Clifford, by counsel who were paid for such arguments by these complainants; that these complainants paid counsel on both sides for preparing the record in said cause and for arguing the same on the appeal before said Supreme Court, and that both in said Circuit Court and in said Supreme Court these complainants controlled the preparation and argument of the said cause so as to make the same collusive in both courts; that upon due proceedings had in that behalf these facts were laid before the said Supreme Court of the United States, at the adjourned term in October, 1872, and that in their answer, filed in the course of these proceedings, these complainants admitted that in said suit they had paid the counsel employed for the pretended defense, as well as for themselves, in the Circuit Court, and subsequently in said Supreme Court, and thereupon the said Supreme Court of the United States did, as this defendant is informed and believes, on or about the third day of March, A. D. 1873, annul and vacate its affirmance of said decree in Rhode Island, and dismissed the said false and collusive appeal, and recalled the mandate which had been issued to said Circuit Court, by reason of the said cause having been merely collusive both in the court below and in the said Supreme Court, so that said decrees are not in anywise conclu-

sive as to the validity of the said reissued letters-patent set out in the bill of complaint in this cause, nor as to the rights of the complainants alleged therein.

And for answer to the interrogatories in said bill contained, this defendant says, to the first of said interrogatories, that he has made, or cause to be made, and has sold dental plates made wholly or partly of hard rubber or vulcanite since the seventeenth day of July in the year one thousand eight hundred and sixty-six.

To the second of said interrogatories, this defendant, answering, says that he has made, or caused to be made, and has sold dental plates made wholly or partly of hard rubber or vulcanite since the first day of January last. To so much of said first and second interrogatories as demands the number of such plates made, or caused to be made, and sold by this defendant, and to the whole of the third and fourth of said interrogatories, this defendant respectfully suggests, by way of objection, exception, and demurrer, that these complainants are not or are not at this stage of this cause entitled to answers to said parts of said first and second interrogatories, nor to any part of said third and fourth interrogatories, for the following, among other reasons, to wit: that said parts of said first and second interrogatories, and the whole of said third and fourth interrogatories, are irrelevant and impertinent, and not founded upon any sufficient averment in said bill of complaint; that without an ascertainment and adjudication that this defendant has violated or infringed the reissued letters-patent mentioned in said bill, and until it is decreed that the said reissued letters-patent are good and valid, the complainants are not entitled to the aforesaid information demanded in said interrogatories; and that in advance of a decree for an account, the complainants are not entitled to inquire into the defendant's business, or to demand the particulars or incidents thereof.

To the fifth of said interrogatories this defendant answers No.

To the sixth of said interrogatories this defendant says that he does not keep on hand any dental plates or gums made wholly or partly of hard rubber or vulcanite, but has them made to order only, and delivers them as soon as completed, and has none now on hand.

And this defendant, still insisting upon each and all of the foregoing objections to the bill of complaint, and to the aforesaid reissued letters-patent numbered one thousand nine hundred and four, further answering says, by way of further defenses to said bill of complaint, that he is informed and believes, and upon information and belief avers—

I. That the pretended invention or improvement, or a substantial and material part thereof, or substantial and material parts thereof, described and set forth and claimed in the reissued letters-patent numbered one thousand nine hundred and four, and dated March twenty-first, in the year one thousand eight hundred and sixty-five, was or were not described nor specified nor represented nor suggested nor indicated in the specifications, drawings or model deposited in the United States Patent Office in connection with the application of said Cummings for the original letters-patent numbered forty-three thousand and nine, and dated June 7, A. D. 1864, before the issue of said original letters-patent; nor was nor were such pretended invention or improvement nor such part or parts thereof as aforesaid described or specified or represented or indicated or suggested in the specifications or drawings of said original letters-patent, numbered forty-three thousand and nine, and issued June 7, 1864, but that the said pretended invention and improvement, or the said substantial and material part or parts thereof, was or were first described and set forth and claimed by the said Cummings in the new or amended and corrected description and specification annexed to the reissued letters-patent (granted and issued upon the surrender and cancellation of said original letters-patent) numbered one thousand eight hundred and forty-eight, and dated January tenth, in the year one thousand eight hundred and sixty-five, and that said pretended invention and improvement, or said substantial and material part or parts thereof, was or were again described and set forth and claimed by the said Cummings in the new or amended description and specification annexed to the reissued letters-patent (granted and issued upon the surrender and cancellation of said first-mentioned reissued letters-patent No. 1,848, dated January 10, 1865), numbered one thousand nine hundred and four, and dated March 21, 1865, by

reason of which facts said letters-patent numbered (reissue) one thousand nine hundred and four, and dated March 21, 1865, were granted and issued contrary to law, and were and are null and void.

II. That the claim set forth by said Cummings in the new or amended and corrected description and specification annexed to the reissued letters-patent No. 1,904, dated March 21, 1865, and granted as mentioned in said bill of complaint, does not cover or comprise any device or invention or improvement which is by law the proper subject of letters-patent of the United States, but that said claim is wholly invalid, void, and inoperative in law.

III. That the said John A. Cummings was not the original and first inventor or discoverer of the thing patented, or of a substantial and material part or of substantial and material parts thereof, claimed as new in said reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1865, but that long prior to the pretended invention thereof by said Cummings, the same thing, or a substantial and material part thereof, or substantial and material parts of the thing patented or claimed as new in said reissued letters-patent, was known to and used by the following-named persons, and at the following-named places, to wit:

George E. Hawes, of and at New York City.

C. O. Crosby, of and at New Haven, Connecticut.

William A. Royce, of and at Newburgh, New York.

Elias Wildman, of and at Philadelphia, Pennsylvania.

Charles Goodyear, deceased, formerly of New York City, at said New York City, and at New Haven, Connecticut, and in London, England, and Paris, France.

Charles Goodyear, Jr., of New Rochelle, New York, at New York City, and at New Haven, Connecticut, and at London, England, and Paris, France.

Asa Hill, of and at Norwalk, Connecticut.

Emanuel G. Blackman, of and at Norwalk, Connecticut.

C. S. Putnam, deceased, at New York City.

L. E. Christopher, of and at New York City.

William A. Bevin, of and at Boston, Massachusetts.

F. A. Bevin, deceased, at New Haven, Connecticut.

G. A. Foster, of and at Utica, New York.

Henry B. Goodyear, of and at New Haven, Connecticut, and at New York City.

Willard Ball, of and at Walpole, New Hampshire.

Nelson Goodyear, deceased, of and at New York City, and at New Haven, Connecticut.

Jehial Parmley, of and at New York City.

John Lovejoy, of New York City, and if not deceased, of New York City.

Archibald McIlroy, of Greenwich, Connecticut, and at New York City.

IV. That the said John A. Cummings was not the original and first inventor or discoverer of the thing patented, or of a substantial and material part or of substantial and material parts thereof, claimed as new in said reissued letters-patent No. 1,904, dated March 21, 1865, but that anterior to the supposed discovery thereof by said Cummings the thing patented, or a substantial and material part thereof, or substantial and material parts of the thing patented or claimed as new in said reissued letters-patent No. 1,904, had been described in the following printed publications, to wit:

The Lancet. A Journal of British and Foreign Medical and Chemical Science, Criticism, Literature and News. MDCCCXLV. In Two Volumes Annually. Volume II. Edited by Thomas Wakley, Surgeon, M.P. for the Metropolitan District of Finsbury, and Coroner for the County of Middlesex. London: Printed for the Editor and Published by John Churchill, Princes Street, Soho. In the number of said work for September 13, 1845, pp. 284, 285, 286, 287 of said volume, and in the number of said work for September 20, 1845, pp. 310, 311, 312 of said volume.

The American Journal of Dental Science. Edited by Chapin A. Harris, M.D., D.D.S., etc. New Series, Vol. I. Philadelphia, Lindsay & Blakiston; Baltimore, Armstrong & Berry; New Orleans, John Ball. 1850. Pages 3 to 12 (both inclusive) of said volume, being the number of said journal for October, 1850. Said *American Journal of Dental Science,* Volume IV., New Series, at pages 79 to 93; also at page 176; and also at pages 223–226, being respectively the numbers of said journal

for October, 1853, and for January, 1854. Also in said *American Journal of Dental Science*, Volume VI., New Series, at pages 477, 478 and 479, being the number of said journal for July, 1856.

The Dental News Letter. Vol. IV., January, 1851, No. 2. Jones, White & McCurdy, Proprietors and Publishers, 120 Arch Street, Philadelphia; 263 Broadway, New York, and Branch at 23 Tremont Row, Boston; pp. 59, 60, 61, 62 and 63 of said number of said publication.

The Dental News Letter. Edited by J. D. White and J. R. McCurdy. Published Quarterly by Jones, White & McCurdy, Proprietors and Publishers, 528 Arch Street, Philadelphia; 335 Broadway, New York, and Branch at 16 Tremont Row, Boston. Volume XI., April, 1858, No. 3; pp. 170, 171 and 172 of said number of said publication. Also in said *Dental News Letter* for July, 1858 (being No. 3 of said Vol. XI.,) at pages 253, 254 and 255, and on the second page of the advertisements at the back of said number of said work. Also in said *Dental News Letter* for July, 1859, (being No. 4 of Vol. XII.,) at pages 289 and 290 of said number of said publication.

The Vulcanite. A Quarterly Journal, devoted to the Science of Mechanical Dentistry. Edited by B. W. Franklin, New York. Published by the American Hard Rubber Co., No. 640 Broadway. Vol. I., No. 1, May, 1860, pages 2 to 14 (both inclusive;) Vol. I., No. 2, August, 1860, pages 65, 66, 67, 68, 69, and 70; also Vol. I., No. 3, November, 1860, at pages 99, 100, 101, 102, 103, 104 and 105; also pages 130 to 132; also Vol. I., No. 4, February, 1861, pages 164 to 168, and pages 178, 179 and 180; also Vol. II., No. 1, May, 1861, pages 32 to 36, pages 40 to 43; also Vol. II., No. 2, August, 1861, pages 106 to 110; also Vol. II., No. 3, November, 1861, pages 142 to 146; also Vol. II, No. 4, February, 1862, pages 176 to 181.

The Principles and Practice of Dental Surgery. By Chapin A. Harris, M.D., D.D.S., etc., etc. Philadelphia: Lindsay & Blackiston. Fifth Edition, 1853. Pages 736, 737, 738, 739 and 740.

A Dictionary of Medical Terminology, Dental Surgery and the Collateral Sciences. By Chapin A. Harris, M.D., D.D.S., etc., etc. Second edition. Philadelphia: Lindsay & Blakiston, 1855; at pages 343 and 344, under the title "Gutta-Percha."

Great Exhibition of the Works of Industry of all Nations, 1851. *Official Descriptive and Illustrated Catalogue.* In three volumes. Vol. I., London, 1851; at p. 474. Article No. 720.

Exhibition of the Works of Industry of all Nations, 1851. *Reports of the Juries on the Subjects in the Thirty Classes into which the Exhibition was divided.* London, 1852; at p. 598.

The American Journal of Dental Science. New Series. Volume II., at page 332; being the number of said journal for January, 1852.

Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences. Publies conformement a une Decision de l'Academie en date du 13 Juillet, 1835. Par MM. les Secretaires Perpetuels. Tome trente-troisieme, Juillet-Decembre, 1851. Paris: Bachelier, Imprimeur-Libraire de l'Ecole Polytechnique au Bureau des Longitudes, etc., Quai des Augustins, No. 55; 1851; at page 126.

The Dental Register of the West. Published Quarterly, by order of the Mississippi Valley Association of Dental Surgeons. Cincinnati; John D. Thorpe, Printer, No. 12 West Fourth St., 1850; at pp. 38, 39 and 40, being the number of said Register for October, 1850.

The New York Dental Recorder. Devoted to the Theory and Practice of Surgical, Medical and Mechanical Dentistry. Edited by C. C. Allen, M.D., Dentist. Volume IV. New York: Printed by Grossman & Son, 59 Ann St. 1850; pages 286, 287 and 288, being the number of said journal for September, 1850.

Also, that the pretended invention or improvement described and set forth and claimed in said reissued letters-patent No. 1,904, or a substantial and material part thereof, or substantial and material parts thereof claimed as new, had been long prior to the alleged invention or discovery of said Cummings described in the following letters-patent and application for letters-patent of the United States, to wit: Letters-patent No. 8,075, granted to Nelson Goodyear, of New York city, dated May 6, 1851. Reissued letters-patent No. 556 and reissued letters-patent No. 557, granted to Henry B. Goodyear, administrator of Nelson Goodyear, deceased, each dated May 18, A.D. 1858; being reissues of said letters-patent No. 8,075. Letters-patent No. 9,968, granted to Charles Goodyear, of New Haven,

Connecticut, assignee of Charles Goodyear and Robert Haering, dated April 12, 1853. The rejected application of Robert Haering, of New York, New York, for letters-patent for a new and improved mode of inserting artificial teeth; filed in the United States Patent Office, March 25, 1856. Letters-patent No. 8,621, granted to John Allen, of Cincinnati, Ohio, dated December 23, 1851. Letters-patent No. 12,156, granted to Sharpless Clayton, of West Chester, Pennsylvania, dated January 2, 1855; letters-patent No. 16,708, granted to Alfred A. Blandy, of Baltimore, Maryland, dated March 3, 1857; letters-patent No. 19,916, granted to George Diffenbach, of New York, New York, dated April 13, 1858; letters-patent No. 10,847, granted to Mahlon Loomis, of Cambridgeport, Massachusetts, dated May 2, 1854; and also patented or described in the following English letters-patent, to wit:

No. 11,135, dated March 18, 1846, to Thomas Hancock.
No. 11,208, dated May 15, 1846, to Charles Hancock.
No. 11,209, dated May 15, 1846, to H. V. Bartlett.
No. 12,241, dated August 15, 1851, to E. T. Truman.
No. 13,542, dated March 4, 1851, to A. V. Newton.
No. 24, dated October 1, 1852, to Moses Poole.
No. 43, dated October 1, 1852, to Moses Poole.
No. 577, dated March 14, 1855, to Charles Goodyear, Jr.
No. 893, dated April 21, 1855, to Henri Schoofs.
No. 1,232, dated May 1, 1857, to Alfred A. Blandy.
No. 193, dated January 21, 1859, to James Childs.
No. 1,842, dated August 9, 1859, to F. L. Lawrence.
No. 2,295, dated October 8, 1859, to James Childs.
No. 2,790, dated December 8, 1859, to John Macintosh.
No. 4, dated January 2, 1860, to H. A. Dewar.
No. 1,549, dated June 25, 1860, to Mathew Cartwright.
No. 1,421, dated June 11, 1859, to G. C. Ash.

V. That the pretended invention or improvement described and set forth and claimed in said last-mentioned reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1865, as hereinbefore set forth, or a substantial and material part thereof, was, or substantial and material parts thereof were, in public and common use among dentists and on sale to dentists and others and by dentists and others

throughout the United States, at the time of and before the application for said reissued letters-patent last mentioned, and had so been in public and common use and on sale for more than two years prior to such application, and that the said pretended invention or improvement described and set forth and claimed in said last-mentioned reissued letters-patent, or a substantial and material part thereof was, or substantial and material parts thereof were, in public and common use among dentists and others, and on sale to dentists and others and by dentists and others throughout the United States, at the time of and before the application for the original letters-patent numbered forty-three thousand and nine, and dated June 7, 1864, as hereinbefore set forth; and had so been in public and common use and on sale for more than two years prior to such application for said original letters-patent; and such use and sale as aforesaid was had, *inter alia*, by the following-named persons and at the following-named places respectively, to wit:

Clarke S. Putnam, deceased, of and at New York City.

Bradley W. Franklin, of and at the City of New York.

The American Hard Rubber Company of Bethany, Connecticut, and Flushing, New York, and New York City.

Henry B. Goodyear, of and at New Haven, Connecticut.

E. E. Crofoot, of and at Hartford, Connecticut.

A. W. Todd, of and at Montgomery, Alabama.

James Taylor, of and at Cincinnati, Ohio.

Hawes, Bro. & Seabury, of and at Providence, Rhode Island.

T. H. Burras, of and at New York City.

Spencer Roberts, of and at Philadelphia, Pennsylvania.

A. E. Pursell, of and at Madison, Indiana.

S. S. Blodgett, of and at Ogdensburg, New York.

C. Palmer, of and at Warren, Ohio.

R. Russell, of and at Nashville, Tennessee.

Miller & Hale, of and at Rockford, Illinois.

John Mc alla, of and at Lancaster, Pennsylvania.

F. A. Bevin, deceased, at Walpole, New Hampshire, and at Boston and Cambridge, Massachusetts, and at New Haven, Connecticut.

Ira A. Salmon, of and at Boston, Massachusetts.

Willard Ball, of and at Walpole, New Hampshire.

Nathan C. Keep, of and at Boston, Massachusetts.

Roswell Cutler, of and at Boston, Massachusetts.

Samuel Mallett, of and at New Haven, Connecticut.

Elbridge G. Leach, of Stoughton, Massachusetts, at said Stoughton, and at Boston, and at Cambridgeport, Massachusetts.

Seth P. Miller, of and at Worcester, Massachusetts.

Dennis S. Bartlett, of and at Boston, Massachusetts.

Ambrose Lawrence, of and at Lowell, Massachusetts.

VI. That (still denying that said Cummings was the original or first inventor of the pretended invention or improvement described and set forth and claimed in said reissued letters-patent numbered one thousand nine hundred and four) the pretended invention or improvement described and set forth and claimed in said last-mentioned reissued letters-patent, or a substantial and material part thereof, or substantial and material parts thereof, had been in public use and on sale with the consent and allowance of said Cummings for more than two years before his application for said reissued letters-patent, and for more than two years prior to his application for said original letters-patent numbered forty-three thousand and nine, as hereinbefore set forth; and such use and sale thereof was had and made as aforesaid, with the consent and allowance and with the knowledge and acquiescence of said Cummings, among others, by the following-named persons, and at the following-named places, to wit:

F. A. Bevin, deceased, late of Boston, Massachusetts, at said Boston, at Cambridge, Massachusetts, and at New Haven, Connecticut, and elsewhere.

W. A. Bevin, of New York, at Boston, Massachusetts.

N. C. Keep, of and at Boston, Massachusetts.

I. A. Salmon, of and at Boston, Massachusetts.

Seth P. Miller, of and at Worcester, Massachusetts.

Roswell Cutler, of and at Boston, Massachusetts.

Ambrose Lawrence, of and at Lowell, Massachusetts.

B. W. Franklin, of and at New York City.

The American Hard Rubber Company, of Flushing, New York, and of Bethany, Connecticut, and of New York City, at New York City and elsewhere.

VII. That (still denying that said Cummings was the original and first inventor of the pretended invention or improvement described and set forth and claimed in said reissued letters-patent numbered one thousand nine hundred and four) the said Cummings, previous to the date of said reissued letters-patent, and previous to the date of his application therefor, and previous to the date of the reissued letters-patent numbered one thousand eight hundred and forty-eight, as hereinbefore set forth, and previous to his application therefor, and previous to his application for said original letters-patent No. 43,009, suffered the said pretended invention and improvement or the substantial and material part or parts thereof described and set forth and claimed in the amended and corrected specification signed by him, and annexed to said reissued letters-patent numbered one thousand eight hundred and forty-eight, and again described and set forth and claimed in said reissued letters-patent numbered one thousand nine hundred and four, to be used freely and fully by the public for more than two years, and acquiesced in and permitted and assented to such use without asserting any claim or right thereto, and thereby waived and abandoned the same, and dedicated the same to public use, and surrendered and forfeited or lost any right he might have had in or to said pretended invention or improvement, or to letters-patent of the United States therefor, or under such letters-patent.

VIII. That by English letters-patent, numbered 577, and dated March 14, A. D. 1855, granted and issued to Charles Goodyear, Jr., then residing in Paris, France, the pretended invention or improvement described and set forth, and claimed in said reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1855, or a substantial and material part, or substantial and material parts of said pretended invention or improvement, was or were patented in a foreign country more than six months prior to the application for said reissued letters-patent last mentioned, and more than six months prior to the application, as hereinbefore set forth, for the reissued letters-patent numbered one thousand eight hundred and forty-eight, and more than six months prior to the application, as hereinbefore set forth, for the original letters-patent

numbered forty-three thousand and nine, and that the same had been introduced into public and common use in the United States (as hereinbefore more particularly set forth,) prior to the application for said reissued letters-patent, respectively, and prior to the application for said original letters-patent, and more than two years prior to said applications, respectively, for said reissued letters-patent numbered one thousand eight hundred and forty-eight and one thousand nine hundred and four, and more than two years prior to said application for said original letters-patent numbered forty-three thousand and nine, wherefore said reissued letters-patent numbered one thousand nine hundred and four were and are null and void.

IX. That (still insisting upon the aforesaid defenses and each of them) the pretended invention or improvement described and set forth and claimed in said reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1865, or a substantial and material part, or substantial and material parts, of said pretended invention or improvement having been so as last aforesaid patented in a foreign country, more than six months prior to the application for said original letters-patent numbered forty-three thousand and nine, said letters-patent numbered forty-three thousand and nine, and dated June 7, 1864, and said reissued letters-patent numbered one thousand nine hundred and four, and dated March 21, 1865, were by the Acts of Congress in such cases made and provided limited to the term of seventeen years from the date or publication of said foreign letters-patent granted to Charles Goodyear, Jr., as last mentioned, and therefore ceased to be of any force or effect on or before the fifteenth day of March in the year one thousand eight hundred and seventy-two, or on or before the ninth day of September in said year one thousand eight hundred and seventy-two, according as the date or publication of said foreign letters-patent shall be held to have been the fourteenth day of March or the eighth day of September in said year one thousand eight hundred and fifty-five.

X. That as matter of fact, the aforesaid foreign letters-patent No. 577, so granted as aforesaid to said Charles Goodyear, Jr., were dated March 14, A.D. 1855, and expired under the provi-

sions of the laws of England in such cases made and provided, and under the conditions contained in said letters-patent, on or before the fourteenth day of March in the year one thousand eight hundred and fifty-eight, and that, as matter of law, the said fourteenth day of March, A.D. 1855, is to be deemed and taken in this cause as the date or publication of said foreign letters-patent, and that the term of said original letters-patent numbered forty-three thousand and nine, and of said reissued letters-patent numbered one thousand nine hundred and four, could only have lawfully been for seventeen years from said fourteenth day of March, A.D. 1855, and that said term of said reissued letters-patent therefore expired on or before the fourteenth day of March in the year one thousand eight hundred and seventy-two, and before the filing of the bill of complaint in this cause, and that said reissued letters-patent numbered one thousand nine hundred and four had, for the foregoing reasons, ceased to be of any force or effect whatever before the filing of the said bill of complaint.

XI. That the schedule or specification and claim of said Cummings annexed to and forming part of said reissued letters-patent numbered one thousand nine hundred and four, is informal, insufficient, and void in law, and does not and cannot entitle the said Cummings or his assigns or legal representatives to any exclusive use, possession, or enjoyment of the pretended invention or improvement described and specified in said schedule or specification and claim; and the said Cummings or his assigns or legal representatives cannot hold or enjoy the exclusive right or title to said pretended invention or improvement by virtue of his said reissued letters-patent. That the pretended invention or improvement described and set forth and claimed in the said reissued letters-patent, numbered one thousand nine hundred and four, consists only in the substitution of a material well known and in public use long prior to the pretended invention or discovery of said Cummings for other materials which had long theretofore been known and used for the same purposes, in the same mode, and by the same means described in said reissued letters-patent, or in filling the long theretofore well-known moulds with the long theretofore well-known preparations of india rubber or caoutchouc instead of

with metal or other materials, and subjecting the long theretofore well-known material to the long theretofore well-known process of vulcanization in the long theretofore well-known way.

And this defendant, still insisting that such substitution of hard rubber or vulcanite, or its equivalent, was not first invented by said Cummings, but had long prior to his pretended invention been known and used by the persons and at the places specified in the foregoing clauses of this answer marked III. and V., and described in the printed publications specified in the foregoing clause of this answer marked IV., further insists that even if said Cummings were the original and first inventor of such substitution of a plate of vulcanite for the plates of different materials theretofore used, such substitution of one material for another is not patentable subject matter for letters-patent of the United States, and that therefore said reissued letters-patent numbered one thousand nine hundred and four were and are null and void.

XII. That if the pretended invention or improvement described and set forth and claimed in the said reissued letters-patent numbered one thousand nine hundred and four embraces or comprises the means or mode or method of obtaining the impression of the mouth and of preparing the moulds and of setting the teeth in the moulds, or the method of making and using said hard rubber or vulcanite plates set forth in said reissued letters-patent, then said reissued letters-patent were and are null and void, for the following among other reasons:

First. Because said Cummings was not the original and first inventor of such means or mode or method of obtaining the impression of the mouth, or of preparing the moulds, or of setting the teeth in the moulds, or of the method of making and using said hard rubber or vulcanite plates, set forth in said reissued letters-patent, but the same or substantially the same means or modes or methods had been known and used and patented, and described in public works long prior to such supposed invention by said Cummings, by the persons and at the places and in the printed publications specified in the foregoing clauses of this answer, marked III., IV. and V.

Second. Because such pretended invention or improvement, so described, set forth, and claimed in said reissued letters-patent, was not described, suggested, or indicated in the specification or drawings of said original letters-patent numbered forty-three thousand and nine, but was new matter interpolated in said reissued letters-patent numbered one thousand nine hundred and four, such interpolation of said new matter in said reissued letters-patent making a radical change in the specification and in the pretended invention or improvement described and set forth and claimed in said reissued letters-patent from the pretended invention or improvement described and set forth and claimed in said original letters-patent numbered forty-three thousand and nine.

Without this that any other matter or thing in the said complainant's bill of complaint contained material or necessary to make answer unto, and not herein and hereby well and sufficiently answered, traversed, confessed and avoided, or denied, is true to the knowledge or belief of this defendant.

All which this defendant is willing to aver, maintain, and prove as this honorable court shall direct, and humbly prays to be hence dismissed with his reasonable costs and charges in this behalf most wrongfully sustained.

W. H. GATES.

UNITED STATES OF AMERICA,
EASTERN DISTRICT OF PENNSYLVANIA, } *ss.*

William H. Gates, the above-named defendant, being duly sworn, says that he has read the foregoing answer by him subscribed, and knows the contents thereof, and that the same is true of his own knowledge except as to matters which are therein stated to be on his information or belief, and as to those matters he believes them to be true.

W. H. GATES.

Subscribed and sworn to before me,
this 12th day of May, A.D. 1873. }

{ NOTARIAL SEAL. }

FRANK M. ETTING,
Notary Public.

IN THE CIRCUIT COURT OF THE UNITED STATES,
In and for the Eastern District of Pennsylvania,
IN THE THIRD CIRCUIT.

GOODYEAR DENTAL VULCANITE COMPANY et al.
vs.
WILLIAM H. GATES.

C. C. U. S.
In Equity.

The replication of the Goodyear Dental Vulcanite Company and Josiah Bacon, complainants, to the answer of William H. Gates, defendant.

These repliants, having and reserving unto themselves all and all manner of advantage or exception to the manifold errors and insufficiencies of the said answer for replication thereunto, say that they will aver, maintain and prove their said bill to be true, certain and sufficient, in the law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by these repliants: without this that any other matter or thing in said answer contained material or effectual in the law to be replied unto, confessed and avoided, traversed or denied, is true, all of which matters and things these repliants are and will be ready to prove as this honorable court shall direct, and humbly pray as in and by their said bill they have already prayed.

For complainants,

GEO. HARDING,
J. E. SHAW,
Solicitors.

True copy.

[L. S.] SAMUEL BELL, *Clerk Circuit Court U. S., Eastern District of Pennsylvania.*

THE

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ARTICLE I.

Southern Dental Association.

The Southern Dental Association, composed of members of the profession from all the Southern and some of the Northern States, commenced its fifth annual session, July 29th, at Raine's Hall, Baltimore. The following were the officers of the Association: President, Dr. H. M. Grant, Abingdon, Va.: 1st Vice-President, Dr. F. J. S. Gorgas, Baltimore, Md.; 2nd Vice-President, Dr. T. T. Moore, Columbia, S. C.; 3rd Vice-President, Dr. A. C. Ford, Atlanta, Ga.; Corresponding Secretary, Dr. O. J. Bond, Warren, S. C.; Recording Secretary, Dr. James F. Thompson, Fredericksburg, Va.; Treasurer, Dr. H. A. Lowrance, Athens, Ga.; Executive Committee, Drs. W. W. H. Thackston, F. J. S. Gorgas, John Mahoney, A. G. Bouton and A. C. Ford.

The convention was called to order about 10 o'clock, by the President, Dr. Grant, and the session was opened with prayer by Rev. Dr. Spangler. The roll of members was called by the Secretary, Dr. Thompson, and the following were found to be present: B. B. Alford, La Grange, Ga.; A. G. Bouton, Baltimore, Md.; F. Y. Clark, Savannah,

Ga.; Thomas F. Chupein, Charlestown, S. C.; G. G. Davidson, Lexington, Va.; E. Floyd, Fayetteville, N. C.; F. J. S. Gorgas, Baltimore, Md.; Hugh M. Grant, Abingdon, Va.; James Johnson, Staunton, Va.; J. H. Moore, Richmond, Va.; W. A. Miles, Norfolk, Va.; James F. Thompson, Fredericksburg, Va.; J. R. Walker, New Orleans, La.; Wm. C. Wardlaw, Abbeville, Va.; A. F. McLaine, New Orleans, La.

The President, Dr. Grant, then delivered the annual address. He referred to the favorable auspices under which the Southern Dental Association holds its present meeting. Only five years had elapsed since its organization, and one need only to look over the record of its transactions to be impressed with the vitality which it exhibits. Its discussions and reports evince a degree of scientific progress that is wonderful, and show that the impression is advancing out of the contracted sphere of mere artistic mechanics into the broader and higher field of thorough scientific investigation. The rapid strides which had been made by the dental profession at large during the past few years were then spoken of. There are now published seven dental periodicals, and eight dental colleges are now in prosperous existence. The establishment of a chair of Oral Surgery in the University of Pennsylvania, and the introduction of dentistry into the Medical department of Harvard College, the speaker claimed, might be taken as an indication of the spirit of the times. Dentistry should be classed with oral and opthalmic surgery, both of which were never considered apart from general medicine.

Dr. J. H. Moore was then appointed to act as Treasurer, that officer not being present.

Dr. James Johnston, Chairman of the Committee on Membership, reported the following applicants: Dr. James H. Harris, Dr. S. H. Williams, Dr. B. Coy, Dr. M. W. Foster, Dr. H. H. Keech, Dr. E. P. Keech, Dr. S. M. Field, Dr. A. McCloud, Dr. R. B. Winder, Dr. George Massamore and Dr. A. P. Gore, of Baltimore; Dr. R. F. Hunt and Dr. H.

B. Noble, of Washington; Dr. G. A. Sprinkle, of Madison Courthouse, Va.; Dr. J. R. Walker, from the Dental Association of New Orleans, La.; Dr. E. A. Bogue, N. Y.; Dr. G. H. Chewning, Fredericksburg, Va.; Dr. C. Little, Maryland; Dr. V. E. Turner, Raleigh, N. C.; Dr. E. L. Hunter, Enfield, N. C.; Dr. H. Henkle, Staunton, Va. All the applicants were elected.

Professor Gorgas submitted the report of the Executive Committee. He stated that Raine's Hall had been procured by the Faculty of the Baltimore College of Dental Surgery, as being better fitted for the purposes of the Convention than a lecture room in a college building. No arrangements could be effected with the railroad companies in reducing the rates of fare of the delegates to the Association. Professor Gorgas also stated that the proprietor of the Carrollton Hotel had promised to entertain the delegates at the rate of three dollars per day. From 8 to 10 A. M. daily, was set apart for clinical operations. The business hours were fixed from 10 o'clock to 1 o'clock in the morning, and from 3 to 6 o'clock in the evening.

Drs. J. R. Walker and H. B. Noble presented their credentials as delegates, and were admitted to seats in the Association. Certificates accrediting as delegates Drs. Samuel S. Williams and H. H. Keech, of Baltimore, were also read.

AFTERNOON SESSION.

An afternoon session was held, when the credentials of Dr. S. H. Guilford, delegate from the Odontographic Society of Pennsylvania; Prof. James H. Harris, from the Baltimore College of Dental Surgery, and Dr. A. F. Herr, from the Pennsylvania State Dental Society, were presented and received.

During the afternoon session, Prof. Gorgas, from the Publishing Committee, submitted a report, showing the receipts and expenditures of the committee. The report was accepted and the expenses incurred were directed to be paid.

On motion of Dr. Thompson, the physicians and dentists of the city were invited to seats in the hall.

Dr. S. P. Cutler, of the Committee on Physiology and Surgery, sent a report, which was read by Prof. Gorgas. The report was an elaborate paper upon subjects of physiology and surgery. The paper elicited much interest, and Dr. Chupein moved a vote of thanks be tendered Dr. Cutler for the very able paper. Dr. Clark opposed such a vote being given, claiming that the paper was incomprehensible and impracticable, and did not cover the ground for which the committee was appointed. His objection to the vote of thanks was upon the ground that by giving such a vote the Association would be adopting the paper. The motion of Dr. Chupein was rejected.

Dr. Walker offered the following resolutions:

Resolved by the Southern Dental Association in convention at Baltimore, Md., That the recent action of the railroad combination, in as far as it applies to the Dental, Medical, or Scientific Associations, is not only uncalled for but highly reprehensible.

Resolved, That gentlemen who attend as delegates upon such conventions do so at a great personal sacrifice for the benefit of humanity and the general public good, and that this influence tends greatly to advance the interests as well as the area of civilization, and by so doing to confer a positive benefit upon railroads, which depend upon the advancement and existence of civilization for their business and welfare.

Resolved, That railroad companies could well afford to pass such delegates to and from the places of meeting, and that their refusal to grant, at least upon the return route, passes, is placing a severe tax upon men who spend much time and labor for the public good, and which they are illy able to bare, and that such action by the railroads is as short sighted as it is arrogant and selfish.

Dr. Clark, of Savannah, Ga., delivered an address on Histology and Microscopy. He said he differed from what was laid down in the books as to the cause of dental caries. It had been said that acids were the cause of it, but he con-

tended, after a careful research that caries were caused by parasites. Carbolic acid was a powerful agent for the destruction of these parasites; and it was because tobacco was a powerful disinfectant, and had the effect of destroying these parasites that it was a partial preserver of the teeth.

Prof. McLaine contended that Dr. Clark had taken the effect for the cause. He could not see how a parasite could enter the hard enamel of a tooth.

Drs. Foster and Walker gave their opinions on Dr. Clark's suggestion.

Prof. McQuillan was called upon, and said that he had just arrived from Philadelphia, and was not in a condition to speak upon the subject. He would remark that it is an undecided question whether parasites found on teeth belong to the animal or vegetable kingdom. Whether they are active agents in causing the decay of teeth he did not know. He has often examined them with microscopes and has seen them moving about.

The subject was then laid over for further discussion until to-morrow.

Dr. Chupein suggested that another hall be procured for the next meeting, as there was great difficulty in hearing the speakers in this hall, owing to the busy street on which it is located. The matter was then referred to the Executive Committee, who procured a smaller hall on the story below.

Drs. Williams, Walker and Harris, were added to the Executive Committee, to fill vacancies. Drs. Coy, Harris, James H. Johnston and Prof. McLain, were appointed to operate at clinics for Wednesday morning. Adjourned until Wednesday, 10 o'clock A. M.

WEDNESDAY.—Morning Session.

The session was opened with prayer by Rev. Dr. Spangler.

Dr. James Johnson, chairman of the Committee on Membership, reported the following applicants, who were elected: Dr. John G. Wayt, of Richmond Dr. A. D. Cobey, Mary-

land; Dr. T. S. Waters, Baltimore; Dr. Bernhard Myer, Baltimore; Dr. W. G. A. Bonwill, of Philadelphia.

Dr. Clark stated that there were some delegates present from Pennsylvania and elsewhere, who had come to the meeting under a misapprehension as to the number of delegates that would be admitted from State societies, and he therefore moved that such delegates be admitted as members for this year, and for a longer period if they so desire. The motion was adopted.

Certificates of election as delegates from the Pennsylvania State Dental Society were presented by Drs. F. Hickman, J. Z. Hoffer, F. Welcher, S. Welchens, M. H. Webb and W. N. Amer; by John G. Wayt, from the Virginia State Dental Association, and by Prof. C. A. Kingsbury, from the Odontographic Society of Pennsylvania.

Profs. H. R. Noel and E. Lloyd Howard, of the Baltimore College of Dental Surgery, and Dr. McLain Tiffany, of the University of Maryland Medical School, were elected honorary members.

Dr. Walker moved that Dr. R. N. Laurence be dropped from the list of members, he having been expelled by the New Orleans Society.

Dr. Wardelow, of South Carolina, moved that a committee of three be appointed to investigate the justice of the charges preferred against him. Adopted.

The chair appointed Dr. Walker, of New Orleans; Dr. Wardlaw, of South Carolina, and Dr. Floyd of North Carolina, upon the committee.

On motion of Dr. Clark, the dental and medical students of Baltimore, were invited to seats on the floor.

Dr. Floyd moved that the Treasurer make up the list, and ascertain the names of those who have paid their dues and are entitled to seats on the floor, and to participate in the discussion.

Dr. R. B. Winder and Dr. S. H. Williams, of Baltimore, and Dr. R. B. Alford, of Ga., were appointed upon the committee on dental appliances and improvements.

Dr. Wm. H. Atkinson, of New York, read a very elaborate paper upon histology and microscopy. The paper was deeply scientific, and seemed to have been prepared with considerable care. Before proceeding the Doctor said he intended to say what he meant, and meant what he said. His sole object is to get at the truth, and if anything in his paper was ambiguous he begged to be interrupted, and requested to explain. Their only aim ought to be to get at the truth, though it take hold of the throne of the Infinite. His deepest conviction was that all are of one parentage, and have a right to claim one fraternity. He cared not whether men bless or curse, so they are in real earnest and desire to know the truth. Histology is most crippled, he continued, in the hands of its friends, who grasp at questions beyond their reach. The microscope has so enlarged the domain of knowledge that we prefer to investigate for ourselves rather than read the accounts of others.

After occupying about one hour in reading his production, he said he had just blocked out the way, set the stakes and driven the mule team through. The speaker caused some merriment at times by his style of delivery and seemingly quaint assertions. He was, however, closely listened to throughout, and much importance seemed to be attached to his views by the members of the association.

Dr. Atkinson concluded by saying that he was proud of his profession, as it has been reserved for it to discover the science of being. Advance objections, either in love or hate, so you get out of the conservation that has been handed down by false teaching.

Prof. McQuillan then spoke on the subject of oral parasites. He quoted from Dr. Watson to show that the parasites move in the skin, producing disturbances: each of them has its special domicile. In the mouth of man and lovely woman these parasites move and have their being. Whether they belong to the animal or vegetable kingdom is still an undecided question. When we get to the close boundaries of the animal kingdom we must remain in doubt to which

the subject rightly belongs. Whether they are active agents in the decay and destruction of the teeth is also undecided. There is an analogy between the green substance found on damp stone and that which exerts an influence on the enamel. The monads are the smallest beings discernible under the microscope, but it is doubtful whether they are the smallest beings in existence. There is going on a constant destruction of beings by others struggling into existence in the animal, as well as the vegetable kingdom. The denticula has been observed on the decay of teeth.

It has been assumed that tartar has its origin in the parasites. An analogy has been attempted between the tartar on the teeth and the coral reefs which are considered as the work of parasites. He read a quotation from Herbert Spencer on this subject, and also referred to the services rendered to the profession by Dr. John Richardson, who established an apparent identity between the white and solitary corpuscles. The first element of decay is chemical decomposition.

Prof. Noel, of Baltimore, had never studied particularly the connection parasites had with dental caries; he had regarded caries as being caused by chemical decomposition, and when the enamel decayed he looked upon it as being caused by some inorganic element.

The Association then adjourned until 3 o'clock in the afternoon.

Afternoon Session.

At the afternoon session the President announced that the subject of histology would be continued.

No one seeming willing to enter the contest, Dr. Atkinson arose and said he was pained to see so little interest taken in the subject, and that so many were fighting shy of it, thus leaving it to a few whose lives and reputation were set upon the discharge of the duty required of them. Dr. Atkinson then commenced another scientific discussion of histology.

Before going far he was called to order by Dr. Clark, who said, as he understood it, the subject of parisitie decay was the subject continued to the afternoon session. The chair ruled Dr. Atkinson in order, and time was granted him to proceed.

Dr. Atkinson said he liked what Dr. McQuillan had said upon the subject, but the latter did not put fire enough in his remarks. If Dr. McQuillan had put into his remarks the fire which nature had endowed him (the speaker) with, then the latter would shout hallelujah all the time. (Laughter.)

Dr. Atkinson continued until he was called to order by the chair on account of his having exhausted the allotted time. The discussion ended, and the paper read at the morning session by Dr. Atkinson, was received as the report of the Committee on Histology and Microscopy.

Dr. James B. Hodgkins, of Alexandria, Va., and Dr. Wm. Farmer, of Farmville, Va., were admitted as members of the Association.

Dr. W. C. Wardlaw, of South Carolina, from the Committee on Dental Therapeutics, read a report upon the subject. Therapeutics, he said, was the application of medicine, or means to the cure of disease, but when dental was added to it, the meaning of therapeutics was limited. He argued that the dentist was deprived of the means of observation from the fact that people generally apply to him, only to have their teeth extracted or filled, when they should in cases of dental neuralgia, &c., instead of applying to the general practitioner, apply to the specialist. Often cases belonging to the D. D. S., are placed in the hands of the M. D. The former ought to be oftener called into consultation with the latter.

Dr. Gorgas, of the Executive Committee, reported that they had examined the accounts of the treasurer, Dr. H. A. Lowrance, and found them correct. The account shows that there is remaining in the hands of the treasurer $346.10. Several bills, not included in the Treasurer's report, were

reported by Dr. Gorgas and ordered to be paid. A dispatch was received by the Secretary and read, from Dr. Thomas Moore, of Columbia, S. C., 2nd Vice-President, who was prevented from attending the meeting on account of ill health, sending congratulations.

Dr. F. Y. Clark, from the committee on Operative Dentistry, read a report upon this subject. In treating the subject of the care of children's teeth, he urged the importance of children being thoroughly instructed in the use of the brush. There was not one in five, he said, who knew how to use the brush. It should be used three or four minutes upon the teeth, in order to insure thorough cleansing. He referred to the diversity of opinions among practitioners as to the kind of gold that should be used in filling, and the kind of instrument with which to operate. His advice to practitioners was to practice that with which they were familiar, until they find out for themselves something better.

Prof. McQuillan made some remarks in favor of contour filling. The Creator has made the teeth in the best form, and he desired to raise his voice against condemning contour filling, and he could not let the occasion pass without raising his voice in advocacy of contour filling. In some cases be believed that the treatment in cutting away the consumable part of the teeth, was not proper. When the patient is such that he will take care of it after it is filled, the operation is very desirable. He saw specimens of contour filling that have stood the test of years, and are in themselves works of art. He had some experience in it himself, and had successes as well as failures. He was in favor of Dr. Arthur's plan, but he must raise his voice against the condemnation by that author of contour filling.

Dr. Clark said that the contour filling is a very difficult operation, while in the other plan the machine invented by Dr. Morrison made the task comparatively easy.

Dr. Clark said his experience in contour filling was that it was a failure.

Dr. Walker said that the Association had met in Balti-

more, where the first dental college in the world was established, expecting to receive a perfect flood of light, but he was astonished to find that the members of the Association from Baltimore who were capable of giving light kept their mouths closed.

Dr. Arthur being present, he was called upon to make a few remarks, but declined.

Dr. Walker was surprised that the many distinguished Baltimore dentists present who have given so much time and labor to subjects which absorb the dentist's mind, do not say anything in enlightening the members of the Association.

Dr. Winder thought that there was no special treatment which can be adopted by all operators alike.

Dr. Arthur then said that his plan was misunderstood by many on this floor. There are three methods of treating teeth. The first is that of combatting this prevaleni disease; the second the filling of the teeth, and the third in arresting the decay of the teeth. This last is older than any other method. In cases where the caries of the upper surface is inevitable, it can be arrested by a renewal of the teeth, and then it becomes advisable to separate them. No one will dispute that when two teeth are not attacked by the caries it is extremeiy difficult to determine when to remove the caries. What excuse can there be to induce men to wait until the caries is visible? for then the teeth are already destroyed. He would not dispute the results obtained in contour filling. If it is true that caries occur in consequence of close contact with teeth, then the operation is effective. If it is effective, how many are able to do it, and how many want to pay for it? We must not sneer at any operation; we must consider any method of treatment. The best men in the profession have adopted his (the speaker's) method; that is a gratifying fact, because it contributes to the welfare of the community.

Dr. Atkinson said that it was the misfortune of dentists that they hold on to their old opinions and refuse to accept

what is new. Those among them that are regarded as novices are ahead of those that have toiled their life-long and maintained some dogma. He could not honor a man who stubbornly holds to his opinion, although new discoveries have been made in the science. Those people have no belief, only an opinion. Let us not go one against another, but let our sole aim be to discover the truth. He would like that in these conventions each one would work with zeal, so as to level every man up in his knowledge of the profession. According to the scriptural mandate we should "freely give and freely receive" of the rich treasures of our intellect. The hour of adjourning having arrived the Convention adjourned until Thursday morning at 10 o'clock.

Drs. J. H. Moore, F. J. S. Gorgas, and H. H. Keech, were appointed operators at the clinic for Thursday morning.

THURSDAY—Morning Session.

The Association was called to order at 10 A. M., Rev. Dr. Spangler opening with prayer.

The discussion of the subject of operative dentistry, which was laid over from Wednesday, was resumed. Dr. McQuillan, of Philadelphia, said he had been charged with making an attack upon the paper submitted on Wednesday by Dr. Clark, chairman of the committee on operative dentistry. He disclaimed any such intention—He had a head of his own, and claimed the right to express his views. It had been said during the discussion of this subject that certain things did not pay. Gentlemen, the speaker said, it always pays to do the right thing. [Applause.]

Dr. Clark said this doing the right thing is what every honest man ought to do, and is what every man within the sound of his voice is trying to do. But what is the right thing? That is the rub. Honest men have used mercurial filling, thereby ruining the teeth and entailing misery upon humanity; they believed they were doing the right thing. Many believe contour filling the right thing; the speaker honestly thought it was not; he was now going down the other

side of the hill, and he thought that it was the wrong thing. Contour filling he did not believe would save the teeth. It was the duty of the dentist to save the teeth; do what they will—fill them with putty, if that would accomplish the object—but at all events it was the duty of the dentist to save the teeth. [Applause.] He did not care to see a gold sign show itself every time the lips were parted. It costs from $100 to $200 for such a filling, and men receiving a salary of $1,000 per year were required to pay such a price, when the tooth could be saved at little expense. Is that the right thing? He contended that the cheapest and best way is the right thing.

Dr. Walker maintained that contour filling will save the teeth; it might fail sometimes. The duty of future dentists, the speaker said, would be to give advice, when they would be employed by the year by families, instead of tinkering as they do now.

Dr. Foster said that the thorough dentist looked to the welfare of the whole mouth. Parents intrusted their child to the dentist, with the instruction to do what the dentist deemed best, not only fill the teeth, but place the mouth in the best condition.

Dr. S. Welchens, of Pa. then read a paper entitled "Darwinism *vs.* Six Year Molars." He strongly refuted the doctrine of Darwin that man had its origin in a fish, which had progressed to a frog, to a monkey, to a man, &c. It was as impossible, he said, for a frog to be changed into a monkey as it was to change a mosquito into an elephant or a dog into a horse.

The removal of the six years' molar, the speaker said, has an injurious effect.

Prof. Stellwagen said that the dentists must be governed by principle. If they are not guided by it they may just as well send for a number of coolies, and they can easily be taught the handicraft. A self cleansing surface must be kept, but this cannot be done by simply separating the teeth. Whenever it is possible, the wedging of the food between

the teeth ought to be prevented. When the food will wedge between the teeth it will cause decomposition. When the decay is extensive he could not understand how any one could object to contour filling. There are cases when the extraction of the six years' molar before it made its appearance on the gum is advisable. With regard to wedging, he would always cut away before attempting to drive away.

Prof McQuillan again said that he was in favor of eclectic practice. He was not here to dictate terms or take advantage of his position.

Dr. Chupein thought that whenever self-cleansing can be accomplished it is well to be done.

Dr. Guilford said that the highest aim of the dentist should be the preservation of the teeth. He believed in the judicious extraction of the six year molar. You must keep the teeth from getting crowded. In regard to the judicious extraction of the six year molar, and letting the second molar come into its place, he often succeeded. When a tendency is observed among children to irregularities of teeth, it is best to anticipate by giving the teeth plenty of room. In nine cases out of ten when the arch is expanded a deformity is produced. In cases when the upper jaw shows a tendency to protrude, he would extract the teeth in the lower jaw, and *vice versa.*

Dr. Guilford then addressed himself to the subject of the Degeneration of the Human Race, and asked the question, has the Human Race degenerated? The speaker answered his question in the affirmative, and said that the human frame now is not the same as it was one thousand years ago. A friend of the speaker had examined skulls 4,000 and 400 years old, and there was a great difference between the two, unfavorable to the latter.

Dr. Chupein differed with Dr. Guilford on this subject. The reason that the skeleton of the Egyptian was more perfect in its form was that the Egyptians were not a migratory race. In this country there are large numbers of people of various nationalities, and owing to the intermarriage be-

tween persons of different races you can account for the dissimilarity of the jaws and teeth. A German has wide teeth and wide jaws; an Italian has narrow jaws. Should persons of these two races marry together the child of this union may partake of the jaws of the mother and teeth of the father.

Dr. Walker did not believe in the deterioration of the human race. We have no reliable statistics of the duration of life of human beings in the olden times, but in modern times we have, and when we compare the statistics of the present century with former years, we will find that the duration of life is rather on the increase. The physical development is controlled entirely by local circumstances. There is no race superior or equal to that now in America.

Dr. Arthur said that there are cases when the extraction of teeth becomes a necessity. In cases where it is advisable to give room, it is better to extract the bicuspid than the molar teeth.

Dr. Clark advocated the expansion of the jaw, and was opposed to the indiscriminate extraction of bicuspid teeth, for if that system was continued there would eventually be none to remove, just as if you cut off the tails of dogs for a few years, there would eventually be no tails to cut off. It would also result in disfigured faces, &c.

The subject was further discussed by Drs. Hickman, Webb, Guilford, Walker and Noble, and the paper submitted on Wednesday by Dr. Clark was received as the report of the committee on Operative Surgery.

A letter was read from Dr. W. H. Eames, President of the Mississippi Valley Dental Association, Dr. G. A. Bowman, President of the St. Louis Dental Society, Dr. Price, President of the Missouri Dental Association, and Dr. Wm. N. Morrison, inviting the Association to hold their next meeting in St. Louis, on the first Tuesday in March, 1874, where the Mississippi Valley Dental Association and the Missouri State Association are to hold joint meetings. The matter was laid over. A letter was also read from Dr. W.

W. H. Thackston, of Va., regretting his inability to be present on account of indisposition and sickness in his family.

Prof. T. O. Summers of the Southern University of Greensboro', Albama, and Prof. Joseph Jones, of New Orleans, were elected honorary members of the Association. The chair stated that he desired the members to designate who were going to the session of the American Dental Association to be held at Put-in-Bay, so that he could appoint the delegates from this Association.

The subject of mechanical dentistry was taken up, but no member of the committee upon the subject being present, no report upon the same was made. Some discussion, however arose upon a resolution offered by Dr. James Johnston, "that this Association discountenance the use of the rubber for a base for dental purposes, at least until after a decision of the suit now pending in the Supreme Court."

Dr. Walker thought it would be to the interest of the members of the Association to abandon the use of the rubber.

Prof. McLain believed the use of the rubber lowered the standard of the profession mechanically, but the Association had no right to abridge the privileges of any of its members.

A motion was made to lay the resolution on the table, and the motion was carried.

The Association adjourned until Friday morning, the afternoon being occupied in an excursion.

Before adjourning for the day the Association was invited to enjoy an excursion down the river and a banquet at Pavilion Retreat. The members of the Association, escorted by resident members, marched in procession to Light St. wharf, headed by Minnick's Band, where they embarked on the steamboat Cyrus P. Smith, and were soon steaming down the river. The steamer arrived at Pavilion Retreat about 4 o'clock, and after spending a short time upon the beautiful grounds, repaired to the eating saloon out in the

grove, where they partook of a soft crab and chicken dinner, served in good syle by the proprietor, Mr. Harry McGowan. The lateness of the hour and the exhilarating air of the river seemed to have sharpened the appetites of the excursionists, who attacked the viands with remarkable relish. There was a commendable absence of anything spirituous at the dinner, though there was a profusion of fluids on board the boat. The absence of such exciting influences seemed to have had the effect of doing awaywith the long array of toasts and correspondingly long responses usually inflicted upon such occasions.

The party re-embarked on board the steamer about 6 o'clock, and after returning to the Patapsco river, proceeded some distance down the Chesapeake bay, and arrived in the city shortly after 10 o'clock. The excursionists after landing again formed into line, and accompanied by the band, proceeded to the Carrollton Hotel, where many of the members of the Association were stopping.

FRIDAY—Morning Session.

The President called the Association to order at 9 A. M. followed by prayer.

On motion all members in arrears for two years were dropped from the roll

The discussion on mechanical dentistry was resumed, and the subject of plastic materials considered. It was generally admitted that the celluloid base was a failure, although the pyroxyline had produced better results.

The construction of artificial palates was then discussed, and Dr. Grant said as to the process of manufacture he would refer for description to the last edition of Harris' Dental Surgery, which is minute in detail. He thought the semi-vulcanized rubber should be worked in plaster, or a soft delicate texture used. Models are made of type metal and the materials vulcanized in a temperatureof 310 degrees

Dr. Johnston thought there was a want of uniformity in the material composing the base which caused secretions,

and advised the use of celluloid rather than vulcanized rubber. Upon this question there was considerable discussion-the majority of opinion being against the use of celluloid.

The subject of irregularity of the teeth was then resumed, and Dr. G. H. Chewning, of Va., presented a plaster model of a case of irregularity of the superior central incisors, which he referred to Prof. Gorgas, who described the condition of the mouth, and the method for the correction of the abnormally placed teeth.

Dr. G. F. S. Wright, of S. C., chairman, submitted the report of the Committee on Dental Literature, which contained some very good suggestions, on which, however, no action was taken by the Association. Dr. Wright referred to the new publications of the past year, such as Tome's Dental Surgery, 2nd edition, and Cole's Treatise on Dental Mechanics, both English works. The subject of dental education caused a protracted and interesting debate.

Dr. Arthur said that this subject is one of great interest to every member of the profession. Every individual who comes to their Associations expects to be benefited by his attendance. It is too common for individuals to look to their own benefit without consideration of others. While we take care of ourselves we must also see to the good of others. If we wish to escape the evils which threaten our profession, we must scrutinize the manner in which our colleges are conducted. If any of these institutions turn out a man who is incapable to perform the services of the profession, let the professors of those colleges be held responsible. It is in the power of the dental profession to remedy this evil, and to establish a higher standard by cautioning students against colleges which are improperly conducted. They can establish an institution where the standard of education can be high, and where the professors may be held accountable

Prof. Noel remarked that he had attended the sessions of the American Medical Association, where this subject was continually discussed, referred to committees and then postponed. There is but one institution in the country where

the standard was maintained before the late war, and that was the University of Virginia. It is almost impossible to maintain the standard in our schools and colleges. The fault lies in the American people, and the rapidity with which they push everything through. No education will be of any consequence which is not slowly and steadily acquired. Another defect in the colleges is the fixing of the remuneration of the professors of the colleges, according to the number of pupils in the institutions. He thought that the Austrian method, giving to each professor a certain salary, was the best plan.

Again, the men who study dentistry are not those who have travelled extensively and have had a mental training. The colleges ought to supply the deficiency and teach them not only how to use their hands, but also their mind. The study of anatomy, chemistry, and physiology ought to be adopted. There is no success which is not obtained by hard, earnest labor.

Another evil in the system of colleges is lecturing against time. He always prepared his lectures before entering the lecture room, and each year he had reason to be proud of his school.

Prof. McLain, of New Orleans, said that two years is an insufficient time for any student to complete his studies. It would be a desirable plan to lengthen the term to three or four years.

Dr. Clark said that he had no partiality or prejudice toward any college, but it must be said that the dental education is disreputable to the profession. Why not seek some better road when we know that the present system is imperfect. It is not the fault of the profession, but rather the dental colleges. The Association has sufficient influence and enough money to endow a university, as the professors of existing institutions are not willing to resign their positions for the good of the profession. The time has come when the Association will have to endow such an institution, as dental education has not kept pace with other improvements.

Dr. Clark then called for the report of the committee appointed at the last meeting to enter into negotiations with the dental colleges so as to bring them under the control of the Southern Dental Association; and stated that one gentlemen he knew of was willing to pay two thousand dollars towards endowing a dental college.

Dr. Grant, chairman of the committee (Prof. Gorgas in the chair,) read the report, which stated that the committee had written to the Baltimore College of Dental Surgery and to the New Orleans Dental College. Both of them rejected the request of the committee. The Baltimore College offered to the Association the endowment of a professorship in histology and microscopy. Nothing has therefore been effected by the action of the committee.

Professor McQuillen, of Pennsylvania, did not think that there were too many colleges. There are at least one thousand members added every year to the profession. The point is, are the colleges properly managed? It may be true that the best plan is to endow these institutions, but where is the man in the profession to endow them. The necessities of the professors are such that they cannot devote their entire time to teaching. The speaker thought that it would redound to the advantage of the profession if a State law was passed compelling each individual desiring to enter the profession to study a number of years.

Professor McLain defended the step taken by the New Orleans College, and stated that if any offense was taken from it, he was very sorry, as such was not intended.

Professor Gorgas, Dean of the Baltimore College, said that the proposition of the Association had been carefully considered and respectfully answered by the Faculty of the Baltimore College of Dental Surgery. He asked if the Association was able to assume the burden of supporting a College? Are the members willing to be subjected to a heavy tax in its behalf? Is any gentlemen present, able, and if able, willing to be subjected to a heavy annual tax to support any institution? The Southern Dental Associa-

tion at the commencement of the present session, consisted of one hundred and twenty-seven members; and at least one hundred thousand dollars would be required to properly endow a dental college, in addition to all that could be received from students. As one of the founders of the Southern Dental Association, one of the committee who framed its constitution and by-laws, and its first Recording Secretary, he took great interest in its success, and would use his best efforts to have it succeed; therefore, any proposition coming from this Association through him, would be zealously advocated.

The Faculty of the Baltimore College of Dental Surgery placed it in the power of the Association to establish one professorship, and then by degrees to have control over the college by creating new professorships, or endowing old ones, as their means to do so from time to time justified. To place the Baltimore College in the hands of the Association at this time, would result in a failure to support it, and cause its downfall. He had no aspiration for office in the Association, was not a candidate for any office, and hence was honest in his endeavors to do justice to both the Association and the College he represented.

He also stated that in his opinion, the objections against the proposition made to the Association by the Baltimore College, arose from the filling of the chair, it was proposed to endow, by the Faculty, thereby destroying the aspirations of some members of this Association who desire to become professors in a college, when they do not possess the qualifications necessary for such a position. Again, almost every one who complains of the colleges, is ignorant of their course of study and management, judging them by a few isolated cases occurring years ago when the country was convulsed by civil war, and the majority of the members of the Faculties absent in the army, and when a suspension would have forfeited their charter, and entailed the downfall of the institution by the persecution of the party then in power.

Dr. Arthur said that the action of the Association in ap-

pointing the committee was a mistake. Throw away the sentimental regard for your alma mater, and look alone to the elevation of the profession.

Dr. Walker thought that what was wanted is the combination of all dental associations in America in establishing a dental college.

Prof. Stellwagen spoke in opposition to the endowment of any College. He claimed that the excellency of the universities of Germany consists in the devotion and self-sacrifice of the faculties, the members of which, although receiving a small income, are independent of any masters. Endowments will not make a good college. Every one must individually do all he can to advance his profession. The moment the schools are endowed, the faculties must look to the manufacturer and the dental author, grown wealthy by his wares and books, and you will bring about a servitude which any honest man would shrink from as contemptible.

Dr. Coy then moved to re-commit the report to the committee, in order that a proposition from an institution in an embryo state might be received; which motion was ruled out of order by the President.

Dr. Johnston, of Virginia, moved that the letter read at the morning session, received from the New Orleans College of Dentistry, relative to consolidation with Baltimore, be not accepted.*

The motion was withdrawn after a few remarks by Dr. Grant, who moved that the whole matter be laid upon the table, which was carried.

Dr. Robert Arthur, was elected an active member, and Dr. C. F. Grindall, Dr. J. Wm. Welsh, of Baltimore, and Dr. John H. Crawford, of N. C. were elected members of the Association.

The meeting then adjourned until 3 P. M.

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* We publish in the present number, the answers of the Baltimore College of Dental Surgery, and the New Orleans Dental College, to the Southern Dental Association.

Afternoon Session.

The Association reassembled in Raine's Hall at 3 o'clock in the afternoon, there being but a slim attendance; so many of the delegates having left for their homes, and all the important business being over, that scarcely a dozen attended the afternoon session, which completed the work of the Association for this annual meeting.

Dr. Winder, of Baltimore, made a few remarks upon the Baltimore College of Dental Surgery; but as no member of the Faculty of this institution was present to reply to him, his remarks elicited no response, and the further discussion of the subject was postponed.

Dr. James F. Thompson, Recording Secretary, read a paper from Dr. S. J. Cobb, chairman of the Committee on Voluntary Essays, treating upon colleges and operative dentistry.

The report of the Committee on Dental Appliances and Improvements, was read by Dr. Foster, of Baltimore, and adopted.

Prof. McLain read an able paper on the causes of decay of the human teeth, which was accepted.

St. Louis was selected for the next place of meeting of the Association, on the last Tuesday in July, 1874.

A resolution offered by Dr. Clark to change the name of the Southern Dental Association to the National Dental Association, was called up, debated, and lost.

The following resolution offered by Dr. Thompson, was adopted:

Resolved, That a vote of thanks from this Association is due to Dr. Samuel S. White, of Philadelphia, for his untiring and gratuitous efforts in behalf of the dental profession, in successfully resisting the illegal action of the Goodyear Dental Vulcanite Company in the Gardner case.

Resolved, That we hereby express our unqualified confidence in his integrity, and in his ability to conduct to a successful issue any litigation which he may undertake in our behalf.

An election of officers for the ensuing year resulted in the following gentlemen being declared elected, viz: President, Dr. Robert Arthur, Baltimore; 1st Vice-President, Dr. Theodore F. Chupein, Charleston, S. C.; 2nd Vice-President, Dr. James Johnston, Va.; 3rd Vice-President, Dr. E. Floyd, N. C.; Corresponding Secretary, Dr. Samuel M. Field, Md.; Recording Secretary, Dr. James F. Thompson, Fredericksburg, Va.; Treasurer, Dr. J. Hall Moore, Richmond, Va.; Executive Committee, Dr. J. R. Walker, New Orleans; Dr. W. N. Morrison, St. Louis; Dr. W. G. Redman, Louisville, Ky.; Dr. Jonathan Taft, Cincinnati O,; Dr. S. J. Cobb, Nashville, Tenn.

The President elect was escorted to the chair, who thanked the Association for the honor conferred upon him. The retiring President, Dr. Grant, also made a few happy remarks.

A unanimous vote of thanks was tendered to Dr. Grant for the efficient and impartial manner in which he had discharged his duties; also to Colonel Coleman, of the Carrollton Hotel, for reduction in charges.

Although the Faculty of the Baltimore College of Dental Surgery furnished Raine's Hall for the meetings of the Association, no notice was taken of this fact by the few members present at the closing session; votes of thanks were tendered to others, however, for smaller favors.

ARTICLE II.

The Southern Dental Association and the Dental Colleges.

Southern Dental Association, at the Richmond Meeting, 1872.

Resolved, That in furtherance of the object of this resolution the President of this Association be requested to appoint a committee of one from each of the Southern States, the President of the Association, *ex-officio*, being chairman, whose duties it shall be to correspond with the faculties of the Baltimore and New Orleans Dental Colleges in relation thereto, and ascertain from

them upon what terms either or each of them will consent to a reorganization of their faculties, or an amalgamation of the two colleges, and in consideration of a compliance with either of these terms, the college so reorganized will be adopted and endowed by this Association; that the said committee be instructed to bring this enterprise prominently before the members of the profession in their respective States, and at the same time request of their brethren what amount they will subscribe towards this endowment, and report to the Association the whole matter at our next annual meeting in Baltimore."

ABINGDON, VA., February 10th, 1873.

To the Dean of the Faculty of the Baltimore College of Dental Surgery:

DEAR SIR:—By the terms of a resolution adopted by the Southern Dental Association at its last annual meeting, it is made my duty as *ex-officio* chairman of the Committee on Professional Education and Dental Colleges, to open a correspondence with the Faculties of the Baltimore and New Orleans Dental Schools, and submit the following enquiry and proposition for their consideration, and report the result to the next annual meeting to be held in the city of Baltimore, July, 1873, viz:

Will the Faculty of your School consent to a reorganization; and if judged expedient, and promotive of the interest of dental education, to a combination and consolidation of the two Southern Colleges, viz: The Baltimore and New Orleans, upon the condition and assurances that the School so formed from the elements of the two above named Institutions, and such other materials as may be available and desirous, shall be adopted, and as liberally as may be, endowed by the said Southern Dental Association, &c.?

In executing the duty confided to me, it is proper, and no less due the Body I represent, than the Faculties of the Schools I am commissioned to approach, that a clear and distinct explanation of the motives and reasons which prompted the action of the Association should be made; and to be full and explicit, to place the whole matter beyond the pale of rational misapprehension, we will first state that the Association did *not* mean by its action in the premises. It did not mean to reflect injuriously or

disparagingly upon either the New Orleans or the Baltimore School It did not mean to apply any curt censure, or express any hostility or unfriendliness for either of the Schools, or the individuals composing their respective Faculties; it did not mean to discriminate against either, or in favor of one against the other, nor against both in favor any enterprise of the future. So much for the negative consideration.

But the Southern Dental Association did recognize the fact, and did mean to express the conviction, that a well organized and appointed, an efficiently officered, and liberally *endowed* and supported dental college, was an indispensable necessity in the South; and further, that under existing circumstances, in view of the depleted and exhausted condition of our section, it was impossible to sustain more than *one* such institution. The demands of the present, are for an institution with *all* the facilities and appliances, for the most thorough and complete instruction of dental students in all the departments of the profession; for a college upon a firm, a fixed and *established* basis, commanding and *compensating* the most distinguished talent in our department of science,—an institution independent of the dictation of patrons, and of the accidents and circumstances which often diminish the support of such school below the self-sustaining point.

That for thirty or more years, since the first legal and public recognition of dentistry as a science, the profession have been dependent upon the *unrequited* and *uncompensated* labors of the noble and self-sacraficing men who have generously and faithfully filled our *chairs*, and benevolently trained and instructed our students; that such service could not reasonably be relied upon, as indefinite and perpetual, and should not in *honor* continue a tax upon the time and labor of our benefactors, without our looking to some measure that would reward their zeal and fidelity to a profession which claims to be "liberal."

That the present *status* and condition of our educational relations might be earnestly given as follows: We in the South have two colleges, both honored and valued institutions, both challenging our admiration and enlisting our support and sympathies, each necessarily conflicting and competing with the other, both trammeled in their usefulness, restricted and crippled

in their growth and influence; both languishing for support, and almost struggling for existence. That to correct this condition of our educational interest, a combination and consolidation of our schools, a concentration of the patronage, the influence and the *pecuniary resources* of the profession in the South, appeared the most feasible remedy,—and without intending or desiring to infringe or infract any individual or corporate right, privilege or franchise, without the remotest idea or feeling of discourtesy, or without the slightest purpose of officiously intermeddling with the individual or corporate concerns of either School, concluded to submit to your consideration and determination, the only plan which appeared available for the object contemplated.

Having placed the whole matter as we understand it, fully before you, will you have the kindness to submit the propositions of the Southern Dental Association with the accompanying explanations, to a meeting of your Faculty of instruction, or your Board of Visitors, as may be proper, and at your earliest convenience advise us as to the results, so that I may have ample time to make up my report for the ensuing meeting of the Association. With distinguished regard I have the honor to be

Your very obedient servant, &c.,

H. M. GRANT, M. D., D. D. S.

President of Southern Dental Association.

(The same was sent to the Dean of the New Orleans College.)

ANSWER OF THE BALTIMORE COLLEGE OF DENTAL SURGERY.

BALTIMORE, *April* 23rd, 1873.

Pres. of Southern Dental Association.

DEAR SIR:—Your letter as Chairman of the Committee appointed by the Southern Dental Association at its last annual meeting held in Richmond, Va., relating to the two Southern Dental Colleges, was received and presented to the Faculty of the Baltimore College of Dental Surgery, at a recent Faculty meeting, when it was respectfully and carefully considered, and the Dean instructed to reply as follows:

Whereas, the members of the Faculty of the Baltimore College of Dental Surgery are laboring for the interests of the pro-

fession of Dentistry, and have a sincere desire to advance its *status* by every means in their power, and maintain and increase the usefulness of the institution they represent: therefore be it

Resolved, that a Chair of "Microscopical and Comparative Anatomy" be established, and a Professor be appointed to discharge the duties pertaining to such a chair, provided the Southern Dental Association will endow the same, and its members use their influence in advancing the interests of the Baltimore College ofDental Surgery, so long as they are satisfied that the Faculty of this institution are striving by all the means in their power to maintain and advance the *status* of Dentistry.

And be it further resolved, That recognizing in Prof. S. P. Cutler, D. D. S., M. D., of Holly Springs, Miss., a gentleman in every respect qualified by scientific research and attainment to perform the duties relating to a professorship of Microscopical and Comparative Anatomy, he be appointed as the professor of this branch of the Sciences in the Baltimore College of Dental Surgery.

Respectfully, &c.,

F. J. S. GORGAS, M. D., D. D. S.

Dean of the Faculty.

ANSWER OF THE NEW ORLEANS DENTAL COLLEGE

NEW ORLEANS *May* 7th 1873.

Pres. Southern Dental Association.

DEAR SIR:—In conformity with the preamble and resolutions recently passed by the Faculty of the New Orleans Dental College, I herewith transmit to you a copy of the same.

Whereas, at the last meeting of the Southern Dental Association, held at Richmond Va., the idea was then advanced that too great a number of Dental Colleges existed, which prevented them from receiving that encouragement and support which such institutions deserve, thereby inducing a competitive rivalry, which naturally tends to lower the standard of ability in their graduates by too often conferring degrees upon incompetent candidates: and

Whereas, it was also contended that their limited support did not permit them to employ the best talent for the occupancy of

their professional chairs, and to remedy these supposed evils in the South, it was proposed to abrogate one or the other of the two Dental Colleges in the South, [the Baltimore and the New Orleans Dental Colleges,] or to merge them into one, which is to be located at some convenient point, and then to endow the institution thus organized; and now to carry out this intention, a committee was appointed to confer with the Faculties of these respective institutions to ascertain on what terms such an arrangement might be made; therefore be it

Resolved, That this Faculty regards the premises assumed at that meeting as being wholly false and untenable, and the proposition made to abrogate the New Orleans Dental College an impertinent and unwarrantable request.

In the first place no rivalry whatever exists, situated so widely apart as they are, between the Baltimore and the New Orleans Dental Colleges. As an evidence of this fact many students attend lectures in this city who would have gone to Philadelphia; and there are, on the other hand, a larger portion of others who enter the Dental College, who, were it not for the convenience thus afforded, would not have been Dental Students. So far from diverting students from Baltimore, not more than three or four, since the establishment of the New Orleans Dental College, now over six years, have attended its lectures who would have gone to the former; on the contrary, several attendants at this College have gone to Philadelphia to complete their studies, notwithstanding they had been urged to go to Baltimore for that purpose.

Instead of competition acting disadvantageously to the success of collegiate institutions, the very opposite effect obtains; for it is well known that students increase in numbers wherever foci for collegiate instruction are established. In proof of which, witness the extensive, the quadrupled patronage which either of the two Dental Colleges in Philadelphia now annually receives, to what it was when only one existed. The same thing occurred in New Orleans in respect to medical colleges. Neither can this faculty believe that healthy competition can in any way impair the efficiency in dental colleges, or cause a deterioration in the quality of their instructors.

Resolved, That New Orleans being most eligibly situated for

a dental college, commanding by natural as well as artificial communications the whole South-West, and having the States of Mississippi, Arkansas, Louisiana, Texas, and the largest part of Alabama, to which will soon be added California, as direct tributaries for furnishing pupils to her Dental College, its Faculty can not entertain any proposition towards its discontinuance, especially after having weathered all financial difficulties, and become self-sustaining—in fact established upon a firm, permanent basis. Nor are they willing to sacrifice by so doing, the large sums of money that were expended in its organization. The Faculty of this College, performing as they do the duties of Professors without compensation, fling back with contempt the insinuation that unworthy persons are ever graduated by this College merely for the sake of the accompanying fees.

Resolved, That the only arrangement that can be made between the Baltimore and the New Orleans Dental Colleges is a fusion of the former Institution with the latter; the junction thus effected to be located in New Orleans, and its corps of Professors to be selected equally from their present organizations.

Resolved, That from the already established character and usefulness of the Baltimore College, and from the advantageous position of the one in New Orleans, in being able to attract pupils from farther South and West, whose course would naturally tend Northward, the profession in the education of the future dentists of the South, can ill dispense with either of the Institutions named; but it is to the interest of the Southern Dental Association to extend protection and encouragement equally to both.

Resolved, That the Dean of this Faculty be requested to transmit a copy of this preamble and these resolutions to Drs. H. M. Grant, of Abingdon, Va., Chairman of the Committee on Dental Colleges; F. Y. Clark, Savannah, Ga., representing the State of Louisiana on said committee; and to Prof. F. J. S. Gorgas, Dean of the Baltimore Dental College, with a request that he have them published in the *American Journal of Dental Science.*

Very truly yours,

JAS. S. KNAPP D. D. S.

Dean of the New Orleans Dental College.

For the action of the Association and the discussion which followed the presentation of the report of the committee, the reader is referred to the proceedings of the late meeting, which are published in the present number of this Journal.

ARTICLE III.

Physiology of the Dental Structures.

BY S. P. CUTLER, M. D., D. D. S.

The term physiology has a wide and comprehensive scope and meaning, no less extensive than the entire animal and vegetable kingdom; not even stopping there, but ramifying extensively through the inorganic kingdom, embracing some fifteen or more of the simple elements in their binary aspect.

The comprehension of this subject in its broader sense, embraces that of animal, vegetable and comparative physiology. Vegetable physiology begins with the binary, so-called inorganic elements, consisting of earth, air and water, all of which are terrestrial. In searching for our starting point, our primordial prototypal germ cell, we fail to discover its *genesis*, or rather its *biogenesis*, as we have not been able to find its starting point; we have then to content ourselves by commencing with our cell already formed from pre-existing *protoplasm*, *bioplasm*, *nuclear matter*, *cytoblast*, *germinal matter*, or whatever name the most appropriate. Our real, not imaginary germ, when placed in the earth at a proper season, under favorable circumstances, has the power of attracting to itself certain binary compounds, as carbonic acid, water, ammonia and a few others, which already pre-exist in the germ cell, and in some way assimilating them by rearranging their binary character after decomposing them, and converting them into the nerve groups, namely: the quaternary and ternary; the first being true protoplasm of Mr Uxley and others, and the chief element of organic development, the cell builder; the latter the true cell inmate, the combustible in the furnace.

When the leaf of the plant is developed, or *evolved*, this leaf then has the faculty of decomposing, during sunlight mainly, the binaries mentioned above, and reconverting their chemical into organic compounds, *i. e.*, albumen and starch. With this albumen and starch, cells are formed and filled at the point of growth, constituting formed material of the plant. During this stage of growth and devėlopment, the evolution of organic out of inorganic elements, constitutes *vegetable physiology*. After this process is completed, physiology no longer in a strict sense prevails, as the dynamical forces of vegetable growths have ceased, or been converted into a state of hybernation; the object having been accomplished, the work having been done, the materials having been worked up into structures, *i. e.* organic. These structures are of service as storehouses for future building purposes, granaries where materials may be deposited, carried in and out as occasion may require, *ad libitum*.

The plant then is a connecting link between the inorganic and the animal kingdoms; the plant coming from the inorganic direct, and the animal direct from the vegetable. The inorganic kingdom exists prior to, and independent of the vegetable; the plant independent and prior to the animal, but not independent of the mineral, nor prior to it in either case.

All the forces that evolve the plant, must necessarily have pre-existed in the inorganic elements, both in their simple uncombined state, also in their binary condition, otherwise the plant must be regarded as super-terrestrial, or *miraculous* in its advent and continuance on earth. But, reasoning from analogy, and a scientific point of view, we must necessarily adopt the former conclusion—that is the *terrestrial aspect*.

All the minerals found in plants and animals are taken up, in solution from the soil by the *spongiale rootletts;* all the gases by the leaves through their *stomata* or *spiracles*, and there the most wonderful changes take place, where the minerals in solution in water meet the ærial gases,

and there undergo mutual decomposition and recombination, the carbon in the carbonic acid retained and appropriated, it being the chief solid ingredient in the series. This change is mainly determined by an *ultra terrestrial* factor, being no less than the ultra spectral solar ray, *i. e.*, the actinic or chemical, non-luminous and non-calorific ray; this effect is sometimes called actinism. Lime and silica are used in some plants in structural development, as in the outer covering of reeds and grasses. Lime is used in animals, in bone formation.

All the above processes take place mainly during the summer season and cease during cold weather; not so with the higher animals; their dynamical forces cannot be transformed to static force and live; the dynamic condition must continue, or physiology must permanently cease to exist.

If the sap of plants becomes too much chilled, it ceases to circulate; if the blood in warm blooded animals becomes too much chilled, it ceases to circulate, and the animal dies; not so with the cold blooded animal and plant. Some plants, the annuals for example, mature in a season, while others, as most of the perenials, have no definite limitation, and may live and grow well on to a millennium, if not destroyed by man or wearing of the elements. Some animals have but a short lived career, and almost all have somewhat fixed limits, or limits that are not much transcended; other animals, such as some of the giant pachyderms, and some of the cetaceans that continue to grow larger like trees, live from century to century—to an indefinite age.

Nutrition and growth of plants comes directly from the binary elements above named, as means, not as ends—there being no recognized object or aim, only acting in conformity to direction of forces acting on matter.

Animals as a rule, cannot make nutrition direct from the binary elements, which is the simplest and most stable of the whole chemical series of groupings, the plant forces being superior, overcome the binaries and rearrange the elements according to higher laws of organic forces or vege-

table vitality. All higher animals on the other hand, derive their nutrition already compounded from the plant, though an assimilatory process has to be gone through with, and certain changes brought about, before these ends are attained. Though unlike the plant, an entire breaking up and recompounding does not take place, only a rearrangement of the same constituents, without any complete decompositions and new types, as in plant nutrition.

This preparation or assimilation takes place after food is taken into the digestive apparatus of animals, and there undergoes proper changes in mass, to enter the blood for its final career in the vital roll of life, which means molecular and physical motion. After animal life has once begun, it has to be sustained and perpetuated by constant additions of elements, of force, as food and oxygen, which enter from different channels, and meet in common in the blood and tissues everywhere, where certain affinities between oxygen, carbon and hydrogen, are constantly being satisfied, resulting in certain molecular and physical disturbances; these very changes themselves, being the resultants of disturbed equilibrum in forces existing in the various compounds of the organism. No change in matter in any form can take place without a corresponding disturbance, in equilibria of force. For instance, when a molecule of oxygen, which consists of a chromatic scale of atoms (we will say seven, more or less) unites with a molecule of carbon, similarly made up, a disturbance and loss of balance has taken place in these two *so-called* simple elements and new affinities, established by some mutual molecular polar arrangement, by which a certain chemical relationship is brought about, making them into one body instead of two, as before, with a closer approximation of molecules and atoms, than previously existed, by a mean reduction in bulk or volume, *i. e.*, three volumes to two, and a closer approximation of atoms and molecules than previously existed. During this change in the elements the chemical and physical results are just the same as though taking place out of the body, *i. e.*, heat and magnetism are

developed, or set free, and if any suitable conductors are present, certain amounts of magnetic force are sent over them, and if no suitable conductors be present, heat and static electricity only are manifested.

It is the collision and clashing of molecules, the rushing together, then recoiling of atoms, (as of men in battle,) the impact and recoil, the evolutions and counter-evolutions of atoms, according to the dictates of their drill master, their law of discipline that must be obeyed, that constitutes chemical change; as Mr. Huxley says of the growing forrest,—if our ears were fine enough to hear the clashing of atoms in vegetable growth, it would be like the roar of a great cataract or battle; it would be deafening to listen to.

During this molecular change, the disturbance results in motion among molecules, and *vis viva* results, and what is called *dead matter*, follows in the form of carbonic acid and water; the carbonic acid serves only to drug the system, if not regularly removed, its presence at the same time conserves another end; that is, to somewhat smother the oxidizing processes, and prevent a too rapid development of heat. Hence we discover that this dead matter is of service in normal quantities during its presence in the body. The same process takes place during the burning of a house: carbonic acid and water quench combustion in or out of the body.

During this process of combustion or oxidation, motion among atoms seems to be the chief effect brought about. This same motion impresses more or less all other bodies of matter in contact with it, whether solid, liquid, or gaseous, the disturbance more or less deranging, or rather rearranging the molecules by interfering with their polarity, which is a universal law of matter.

A certain amount of heat force developed during oxidation, is taken up by the carbonic acid and watery vapor, and rendered static, or *so-called dead matter*, and so remains until the combination in turn be broken up by new affinities, Then again, there is *vis vivà* generated, which properly

applied, is a working power. In the combustion of a given amount of carbon and hydrogen, whether in the form of incandescent combustion, or by the slower processes in the animal economy, or decay and putrefaction of dead bodies or plants, the same aggregate amount of force or *vis viva* is developed.

When oxidation of zinc takes place, as in the magnetic battery, the larger per cent. of force generated, becomes magnetic force, and if proper conductors be supplied, currents are establishad, certain amounts of heat being generated at the same time, as the solution of zinc becomes heated, and by abstracting the magnetic currents, heat is generated in excess of magnetism. The oxidation of zinc in the battery closely simulates the oxidizing of carbon and hydrogen in the body, where heat and magnetism are established in a similar manner.

In all these processes the same amount of oxygen consumed produces about the same results.

In the animal organization, motion may be regarded as life, and inertia death. All the motions taking place in the body, both molecular change and movement in mass, when in normal amounts, may be taken as physiology; in abnormal amounts, as pathology. Oxidation and nutrition are all the molecule changes taking place in the living body. Oxidation of a molecule of carbon and hydrogen in any tissue, makes room for a molecule of protoplasm, as nutrition, if present, and if not present, too much heat may be generated, and too little magnetism, and if nutrition be too long withheld, fever and death result by starvation, *i. e.*, inanition and syncope. Other causes than the withholding of food, may bring about waste and impaired nutrition, such as fevers in general, when too much oxidation and too little nutrition, then too much heat and too little magnetism result. This wasting process by oxidation is purely chemical just the same in and out of the body, varying only in degree.

The process of nutrition, the sequence of oxidation, is purely a vital process in obeyance of chemical laws, and takes place nowhere outside of living organisms.

This process of waste and reproduction, or life and death of the part, alternately comes under the head of molecular physiology, in contradistinction to other functions and processes; such as the circulation of the blood, respiration, muscular contraction and exertions, and all other processes not dependent on direct, but indirect molecular change.

All the varied changes and processes taking place in the healthy body, are one and all physiological; the digestion and assimilation of food, its entrance to the circulation, and into the various tissues of the body, the uses and distribution made of it, until its final exit again as *debris* or waste matter from the various tissues.

While the kidneys are a set of strainers only, the liver is a great chemical laboratory, having important controlling influences over all other secretions of the entire body, and any derangements here are of vital and signal importance in the category of almost all acute and many chronic diseases. There are other secretions and excretions, as the salivary, pancreatic, pirspiratory, serous and mucous, in general of great importance in the economy.

TO BE CONTINUED.

SELECTED ARTICLES.

ARTICLE IV.

A New Method of Producing Local Anæsthesia.

The interest that has been recently manifested in the profession on the subject of anæsthetics, induces us to take an early opportunity of directing our readers to an important paper, by A. Horvath, of Kieff, published in the *Centralblatt fur die Medicinischen Wissenschaften*, proposing a new method of producing local anæsthesia. It is a well-known fact, that if the hand be immersed for a short time in ice-water, an intolerable pain is caused, and the hand has to be withdrawn. In the course of a series of experiments, made in reducing the temperature of frogs by means of cold alcohol, Dr. Horvath observed that no such pain was produced when the hand was immersed in cold alcohol, not even when the temperature was as low as—5° C.

Pursuing the experiment still further, glycerine was found to possess a property similar in this respect to alcohol. Ether, on the other hand, caused pain, the same as ice-water, while the pain produced by cold quicksilver was more acute, causing the speedy withdrawal of the finger when plunged into this liquid at a temperature of -3°. It was next ascertained that, when the finger was held for quite a long time in alcohol having a temperature of -5° C., no pain whatever was experienced, and what was a still more remarkable phenomenon, although the faintest touch was distinctly perceived in this finger, yet no pain whatever was experienced from sharp pricks, which in other fingers were sufficient to cause considerable pain. This experiment seemed to show that the application of cold alcohol has the effect of depriv-

ing the part of the special sensibility to pain, without, however, impairing the delicacy of the general tactile sensation, which, as is well known, resides in the superficial integument. This apparent possibility of the artificial separation of these two nervous functions, viz., the tactile sensation, and the sensation of pain, and the temporary suspension of the latter, seemed important in a physiological point of view, and also of no small practical utility in allaying certain forms of local pain, more especially that caused by burns, and surgical operations. With regard to burns, Dr. Horvath soon had an opportunity of testing the value of this application on his own person, as well as upon others, and with the most satisfactory results. Not only was all pain instantly allayed, directly the part was immersed in alcohol, but it was found that the wound very speedily began to assume a more healthy appearance, the surrounding redness rapidly failing. The process of healing seemed to be accelerated. If that theory is a correct one which ascribes the frequent termination of burns to the result of the constitutional shock induced by the severity of the pain, in that case the application of cold alcohol, in that it affords the patient an immediate relief from his sufferings, will prove a powerful agent in such accidents in saving life. In like manner, this same application may be found valuable, it is thought, in cases of traumatic tetanus. The method of producing local anæsthesia by the aid of ice, ether and rhigolene has been perfectly understood for many years. These agents have never been extensively employed, however, inasmuch as it has been found by experience that the process of freezing the part is often productive of quite as serious pain as would have been experienced from the operation without the administration of any anæsthetic. The ether spray is found to be a source of embarrassment to the operator, for, if not carefully directed, it is liable to take effect upon his own fingers, bringing on a sudden numbness, which is more surprising than gratifying. It can, moreover, be applied to only a limited extent of surface at a time.

The extreme simplicity of this new anæsthetic, the ease with which it can be applied to any part of the body where pain is experienced, or when it is desired to make an incision—all these circumstances tend to make it highly probable that its employment will ultimately become general, thereby doing away, in a great measure, with the disagreeable and dangerous effects of ether and chloroform.—*Boston Med. and Surg. Journal.*

ARTICLE V.

Bromide of Potassium and the Diseases of Dentition.

BY C. G. POLK, M. D.

As Bromide of Potassium has been applied to nearly every disease to which flesh is heir, anæmia and gastritis perhaps not excepted, I supposed, until recently, that the value of this agent in the disorders of dentition was well understood, and that it was frequently used. Finding the application of it to that class of disorders quite a novelty to many, I will give my experience, hoping to awaken attention to it from those possessing larger fields of observation, to verify or disprove my conclusions.

I have used Bromide of Potassium in about one hundred cases of infantile diseases, embracing those of diarrhœa, pulmonary congestion, and cerebral congestion, arising from dental irritation. I have seen the diarrhœa which had defied chalk, acetate of lead, calomel, catechu, opium, the sulphites, and pepsin, yield in forty-eight hours to this Bromide. I have seen persistent vomiting, which is often in such cases, nought else but reflex action from the brain, cease after a full dose of this agent. I have seen the hot head, with gritting of the teeth, presages of convulsions, yield to a few doses. I have seen pulmonary congestion, dependent on the same cause, yield in a few days.

The most marked case I recollect was a daughter of Mr.

Pickett, of Frankford Arsenal. I had diarrhœa and both cerebral and pulmonary congestion to contend with, and at the time I resorted to the Bromide of Potassium, the case seemed hopeless; under its influence she made a rapid recovery.

The dose must be adapted to each case.—*Med. and Surg. Reporter.*

ARTICLE VI.

Collis' Method of Operating for Hare-lip.

BY THEODORE A. MCGRAW, M. D.

Professor of Surgery in Detroit Medical College.

It is to me a very singular fact that the operation for hare-lip, invented by Mr. Collis, of Dublin, a few years ago, is not described in any of our text-books on surgery. It certainly is superior in its results to any of the old methods, and it was with great disappointment that I found, on reviewing Prof. Hamilton's work on surgery, that he still recommends a mode of operating which is not only out of date, but also exceedingly faulty. If we operate on a patient according to the method described in Prof. Hamilton's work, and union takes place without suppuration, it will seem, at first, to be a success. This success is, however, only apparent, and speedily gives way to a deformity, caused by the contraction of the cicatrix. Where the cut edges were united the new lip will be very thin, and its border will be indented. To obviate this indentation of the lip, and to give it a normal thickness, I am accustomed to resort to the procedure of Dr. Collis, of Dublin. This method is not as well understood by the profession as its merits deserve, and I will therefore briefly describe it.

The essential feature of the operation is the insertion of a flap taken from one side of the cleft into the other side, which is split to receive it. A flap is cut in the usual manner from one side of the cleft, involving the whole thickness

of the lip. This flap is left attached to the vermilion border of the lip. The lip on the other side of the cleft is simply split open from the upper edge of the cleft nearly to the corner of the mouth. By inserting the flap into this split we will evidently increase the thickness of the lip. The resulting scar will be not perpendicular, but longitudinal, and its contraction would make the lip smaller in size, but could not possibly cause any irregularity of its border.—*Detroit Review of Medicine.*

EDITORIAL, ETC.

Separating Teeth.—At the late meeting of the "Illinois State Dental Society," the following discussion arose concerning "Arthur's method:"

Dr. Crouse, of Chicago, remarked that he should advise members to get Arthur's book, and study it, although there was a little appearance of quackery and "gilt edge" about the work, yet, being partially addressed to the public, it might save us a great deal of trouble if our patients would read it.

Separating teeth is a matter of great importance. The first thing to determine is how to effect the separation. In order to be of benefit, it must be permanent. It is not necessary always to make these separations V-shaped, and sometimes, with bicuspids, as in certain cases of irregularity, it is better to have the base of the triangle on the outside, because the pick can be best used if teeth are left in that manner. In the lower teeth, particularly, he should generally have the widest space on the outside, as the saliva from the ducts under the tongue is in great

abundance on the inside, and, hence, can wash out such spaces better; aside from this, it is almost impossible to remove food from between the lower teeth with a pick, if such spaces are made largest from the inside. Arthur does not describe his process minutely enough.

In irregular teeth, the speaker should, in the majority of cases, leave a shoulder, and not make a V-shaped separation.

In front upper teeth, separations may often be made from the palatal side, with cone-shaped burrs, so as to leave the front edges in contact, and thus retain the natural appearance of the teeth.

The proper time for these operations is just as soon as decay commences; parents must be taught that these operations are essential to prevent the necessity of filling within a short time. In the molars and bicuspids there is an objection to these operations, on account of the food pressing in, and being inconvenient in mastication.

The prejudice against these operations must first be removed from the profession, as we are responsible for its existence among the people.

Dr. Miner, Davenport, Iowa—It used to be advocated long years ago that superficial decay should be filed away. In the mouth of a prominent gentleman in the profession, teeth that had been treated in this manner thirty years ago, have not since decayed.

Dr. Chase, St. Louis, was pleased with the amount of vital action acknowledged in the paper. Arthur's plan is, not only to operate upon teeth which already are decayed, but also on those which are perfectly sound, to prevent its occurrence. Eight years ago a lady now living in St. Louis, then a patient of Dr. Arthur's, had her teeth treated by him for prevention. They were at the time perfectly sound; teeth immediately became sensitive, operation was repeated two or three times afterwards, and teeth are to this day tender. The lady has a sister two years younger, whose teeth are perfectly sound; Dr. A. desired to operate upon them in same manner, but the lady being frightened by her sister's experience, declined. Now, to-day, these teeth that have not been operated upon at all, are perfectly sound.

This is a case of positive injury. Merely states this case to

put people on their guard. Where decay has already commenced, the operation is allowable. Is willing to be put on record as against the theory as advocated in that book.

The central incisors on the palatal side can be cut away with good advantage, and without the danger, as in bicuspids and molars, but this has been generally practised a long while. Dr. Arthur's method requires constant attention after the operations; if just as much care is given the teeth under other circumstances, decay would be just as much prevented.

Where there is great pressure of the teeth, the speaker advocates extraction of the second bicuspid, as in children thirteen or fourteen years old. Has practiced this, and knows the first molar will move bodily forward, and not tilt, and also the first bicuspid will move backward. It will also increase the room for the wisdom teeth.

Dr. Marsh, Chicago—Is not converted to Dr. Arthur's method; recommends the use of floss silk to keep teeth clean. In crowded arches expands by spreading bicuspids; fills carious cavities with gold.

Dr. Kulp, Davenport, Ia.—Is now treating a patient who had his teeth filed apart for the purpose of preventing decay. Three or four years ago he had all the proximal surfaces filled with amalgam in the East, which amalgam fillings have since been replaced with gold.

On one side a tooth had been lost, and no filling had been done, there was no decay on that side. He concludes that the cutting away is not safe practice in all cases. It is unsafe in weak constitutions, and between bicuspids and molars.

Dr. Harlan, Chicago.—Teeth should be separated at an early age, and the separations polished frequently afterwards, for at least three years; thoroughness in polishing is necessary; a coarse file or corundum is not sufficient, and square shoulders must not be left, as it is not possible to keep such surfaces clean. The discerning dentist must determine where, and where not, to operate in this manner.

Dr. Low, Chicago.—The more he reads Arthur's work the less he agrees with him. Changing the shape of teeth injures the design of mastication. Cleanliness is essential, without cutting away the material of the teeth.

Dr. Black, Jacksonville, Ill.—Was at first almost disgusted with the book, but after studying closely the controlling idea contained in it (prevention of decay on proximal surfaces) has modified his view. We may do harm in some improper cases, but a great deal of good in proper ones. Decay occurs at points where there is a statical condition of the fluids; if a separation be effected at these points so as to secure free and continuous motion of the fluids, it will be beneficial. In changing the shape, square shoulders must not be left, especially at the gingival border, for the gum to lap over and become irritated, and give out acid secretions. There is an age when all decay ceases; never had decay commence in his own mouth after he was seventeen years old. The fluids of the mouth are in such condition that the teeth could not decay; vital action or no vital action, the phosphate of lime does not dissolve.

MONTHLY SUMMARY.

Chloral as an Application in Fetid Ulcers.—MM. Dusardin-Beaumetz and Hirine communicated at a recent meeting of the Paris Medical Hospital Society the result of the investigations they have been making into the "Anti Putrid and Anti-Fermentiscible Properties of Solutions of Hydrate of Chloral and their Therapeutical Applications." Their attention was first drawn to the subject by the remarkable success which attended the application of a solution of chloral diluted by 100 parts of water to a vast eschar of the buttocks which occured during an attack of typhoid. Since then they have employed the solution in the treatment of various wounds in bad condition, and in suppuration occuring in closed cavities.

With respect to the therapeutical applications, the authors observe that the action of diluted chloral on wounds of a bad nature has been known for some time; Burggraeve having indicated it as one of the best applications. In Italy it has acquired a great reputation, and Dr. Francisco reports the great benefit he has derived from its use in a concentrated from (5 parts to 20) in inveterate ulcers The authors have also employed it in numerous cases of gangrenous wounds and wounds of a bad character, but they have in the great majority of these confined themselves to solutions of 1-50 or 1-100. Several of these cases are published in the *Union Medicale* (May 27 and 29;) and the authors believe themselves authorized to recommend the use of chloral under these circumstances. So also, as it prevents decomposition of the urine, it may render great service in affections of the urinary organs.—*Med. Times and Gazette.*

Death from Methylene Ether.—MR. LAWSON TAIT reports (*Med. Times and Gaz.*, July 5, 1873) the case of S. S., aged 62, admitted to the hospital for women, for a large multilocular ovarian tumour. She was placed under the influence of methylene ether and took it readily and quietly; after five drachms had been administered she seemed so perfectly unconscious that in a few seconds the operation would have been begun. Suddenly she seemed to be coming out of the anæsthesia, the urine passed out of her bladder, and the eyes opened. Mr. Tait noticed the pupils to be extremely dilated, and the pulse suddenly ceased. Some efforts at respiration were made, and a spasmodic effort as if the patient was about to vomit. Respiration then ceasing, it was carried on by Sylvester's method. Strong ammonia was applied under the nostrils, and a strong stimulant enema given. Other means, as rubbing the chest with a brush, dashing cold water over it, etc., were tried unavailingly. It was evident to the acting staff, who were all present, that failure of the heart was the initial part of the process of death.

The post-mortem examination was made within twenty-four hours, and revealed nothing to account for death.—*Med. News.*

Cholera.—Asiatic cholera has again visited the United States, and has made its appearance about two months earlier than it did in 1866. During the last epidemic of this fatal malady, I was the resident physician of the Cincinnati Hospital, and my opportunities for observing the disease in all its stages, and testing the efficacy of various remedies in its treatment, were by no means limited. In almost every case of cholera there is a premonitory diarrhœa, lasting from a few hours to several days, which, if properly treated, is readily cured. In time of cholera

every movement of the bowels, after what is customary and natural, must be regarded as a tendency toward the disease, and after diarrhœa is established, the patient should go to bed and have a physician summoned immediately. The following remedy has been used by the writer in hundreds of cases of cholera, and it will arrest almost every case of the disease in the *first stage*.

Take of laudanum, spirit of camphor and tincture of ginger, each four fluid drachms; tincture capsicum and chloroform, each two fluid drachms; pure brandy, two fluid ounces. Mix. Dose for an adult, a teaspoonful in ice water after each movement of the bowels.

The above remedy will prove as effectual in the rice-water stage as in the first or prodromic stage.—*Druggists' Circular*

Ingrowing Toe-Nails.—A correspondent of the *British Medical Journal* takes the ground that no cutting operation is at all necessary for the complete and rapid cure of ingrowing toe-nail.

If a small, thin flat piece of silver plate be bent at one edge into a slight deep groove, and after the toe has been poulticed twenty four hours, slipped beneath the edge of the nail, so as to protect the flesh from its pressure, and the rest of the thin plate bent round the side and front of the toe, being kept in position with a small portion of resin plaster passed round the toe, a speedy and almost painless cure will take place; and the patient, after the first day, has the additional advantage of being able to walk. This method has been followed in numerous cases with uniform success.

Dr. Blower, of Liverpool, states, in the same journal, that he has, for the past twenty years employed compressed sponge successfully in the treatment of ingrowing nails. He renders the sponge compact by wetting and then tying it tightly, until it is thoroughly dry. A bit of the sponge, in size less than a grain of rice, is placed under the nail, and secured by strips of adhesive plaster. In this way the point of the nail is kept up from the toe until the surrounding soft parts are restored to their normal condition by appropriate means.—*Druggists' Circular.*

Detection of the Substitution of Carbolic Acid for Creasote—In the *Can. Pharm: Journal*, No. 12, vol. 5, there is a communication from Mr. Morrison, London, on the substitution of carbolic acid for creasote. He states that there is no good test for distinguishing between the two, but proposes the use of glycerine, in which carbolic acid is easily soluble, but creasote insoluble. A far better test is the alcoholic solution of perchloride iron [or tr. ferri perchlor. B. P.], which when added to an

alcoholic solution of creasote, produces a "dark greenish-blue" color, but with an alcoholic solution of carbolic acid only a "light brown" coloration. By this test 1 part of creasote in 500 parts carbolic acid can be easily detected. But the adulteration of creasote by carbolic acid is more difficult to detect, but can be ascertained in the following way: Boil a few drops creasote with nitric acid [about 2 drs.] until red fumes are no longer evolved; this yields a solution, which, when neutralized with solution of caustic potash, gives *no precipitate*, the creasote forming oxalic acid. Carbolic acid, when treated in the same manner, is very violently acted on by nitric acid, and forms picric acid. [trinitro-phenylic acid] which when neutralized with solution of potassa, gives a "yellow crystalline" precipitate. One part of carbolic acid in 50 parts creasote can be readily detected in this way.—*Canada Phar. Journal.*

Suppression of Perspiration.—Socoloff gives an abstract of the results which follow varnishing the skin and suppression of the cutaneous secretion.

1. A few hours before the death of the animals so treated, clonic and tetanic spasms appear in various groups of muscles, while the temperature in the rectum sinks in a marked degree.

2. Enveloping the animals in wadding did not serve to raise the temperature or arrest the fatal result.

3 Respiration of oxygen proved ineffectual to resuscitate the animals.

4. In the stomach ulcers were observed, the result of deep extravasations.

5. Albumen appeared in the urine very soon after the skin was varnished.

6. In all cases a diffuse parenchymatous inflammation of the kidneys was observed—sometimes swelling of the cells, and sometimes fatty degeneration. This result was independent of the nature of the varnish used, whether turpentine varnish or gelatine or gum.

Lang [*Arch. d. Heilkunds*, xiii., pp. 277—287, 1872] investigates the cause of death when the skin has been varnished. In addition to other phenomena he found an hour or two after death "triple phosphate crystals" in various parts of the body, and some of the uriniferous tubules blocked with a finely granular dark mass. He thinks that the triple phosphate crystals are the result of decomposition of urea, and that the cause of death is uræmia.—*Am. Journal of Med. Sciences.*

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ARTICLE I.

American Dental Association.

The thirteenth annual session of the American Dental Association was held at Put-in-Bay,commencing August 5th, 1873. The Association was called to order by the President, Dr. P. G. C. Hunt, at 10 A. M. The following named Associations, Societies and Colleges were represented:

California State Dental Association, Pennsylvania Association of Dental Surgery, Southern Dental Association, Ohio State Dental Association, Kentucky State Dental Association, Indiana State Dental Association, Missouri State Dental Association, Michigan State Dental Association, New Orleans Dental Association, Susquehannah Dental Association, Mississippi Valley Dental Association, Chicago State Dental Society, Illinois State Dental Society, St, Louis Dental Society, New York Dental Society, (6th District), Pennsylvania State Dental Society, Harvard Dental School, Philadelphia Dental College, Missouri Dental College, New York Dental College, Pennsylvania Dental College, Ohio Dental College.

Some time was consumed in receiving and examining credentials, paying dues, &c., after which the regular order

of business was taken up. Dr. M. S. Dean read a report on Physiology.

After a few prefatory and apologetic lines, the writer of this report noticed briefly some new views advanced by C. S. Tomes, of London, "On the Developmental Origin of the V-shaped Maxilla," published in the *Monthly Review*. A condensed synopsis, only, was given, and the perusal of the article recommended.

The writer next briefly reviewed two articles written by H. S. Chase, which appeared in this journal—in the May and June numbers, 1873– one of which was entitled "Physiology," and the other "The part which Vital Action Plays in the History of Dental Caries." In the few comments made on the latter article, the writer pronounced the theory "a novel and ingenious one," and though "it lacked sustaining evidence," was in this respect on an equal footing with all other theories advanced upon that subject.

The author of the report next brought up the theory advanced—or rather *statement* made—by Dr. Garretson, in regard to the development of the enamel, in his second edition of "A system of Oral Surgery," which the writer said was new, at least to him. The following quotation was made from that work—page 105–6—and the new theory it contains commented upon:

"The formation of dentine completed, the covering of it with enamel begins; or rather this deposit is, to a degree coincident with the dentinal formation. Secreted by the *same pulp* which formed the dentine, some portion of the *same secretion* finds its way into and through the primary sac. As it passes through this sac it is modified, receives new elements, perhaps, which, as it is received into the second space, or the space between the first and second caps, impresses upon it the arrangement of its particles after the hexagonal order of the enamel."

Although the writer of the report did not agree with Dr. G. in regard to his theory of the development of the enamel, he thought the following facts, as far as they had any sig-

nificance in relation to the subject, might be adduced in favor of the author's views:

"It is admitted generally," the report says, "that the enamel, *after* the tooth has been erupted, becomes more fully developed; receives an additional supply of calcerous salts, and also, that after the enamel has become fully developed, it is the recipient of nutrient matter. This developing material and nutrient substance must come from the dental pulp. If these may be taken from the pulp *after* the enamel organ has disappeared, it would seem *possible* that it may possess the formative power ascribed to it by Dr. G." "But," the report says, "there are histological difficulties in the way which render this view highly improbable."

The writer then averted to a paper written by himself, and read before the Illinois and Iowa State Dental Societies upon the question, "May the Calcific Elements of the Deciduous Teeth be Appropriated in the Formation of any Portion of the Permanent Ones?"

The writer discussed the subject fully, and these are his conclusions, in his own language: "We have seen from the foregoing that the process of nutrition is carried on in an exceedingly prudent and *economical* manner; that the elements taken from the deciduous teeth are not degenerated materials, nor unfit pabulum for other tissues; that the inorganic substance, common salt, may be used over and over again, subserving an important purpose in nutrition, until it is gradually lost with the excrementitious matters; that portions of the disintegrated muscles, which are composed almost entirely of organic substance, may be converted into pabulum for other tissues; that the same identical phosphates may be used indefinitely by animals whose food is deficient in these essential ingredients; and finally—which is a significant fact—we have seen that these lime salts of the deciduous teeth are taken into the circulation at a period of life when these elements are the most imperatively demanded in the *growth* of the young animal."

On motion of Dr. Goddard, action on the proposed amendments to the constitution was made the order of business for 3 P. M.

Adjourned to 2 P. M.

Afternoon Session.

President Dr. Hunt in the chair.

At 3 P. M. the proposed amendments to the constitution were taken up.

Article III, Section 3, was amended to read as follows: The members of this Association shall be of two classes—delegates and permanent members—having equal rights and privileges, except eligibility to office; none but those who, on signing the constitution and paying their dues, declare their intention of becoming permanent members, shall be eligible to office.

Article IX was amended to read: Amendments may be made to the foregoing articles or rules of order at any meeting if there be no dissenting voice

Article VI, Section 1, was amended by inserting in the list of standing committees, the word Aetiology.

Article V, Section I, was amended so that the three names, or in case of a tie, the four names, having the greatest number of votes shall be the sole nominees in case of a failure to elect on the first ballot.

The following resolution passed at the last meeting, was rescinded: Henceforth no person shall be received as a delegate who is in arrears for dues, or until they have paid to the Treasurer the full amount due at the time their names were dropped for non-payment.

Dr. H. Judd, chairman of the Committee on Pathology, made a report which was enthusiastically received. Dr. Atkinson congratulated the Association on the report just read. It evidenced a degree of progress in this branch which was exceedingly gratfying to him; did not agree with the author on some few points, took exceptions to the pronunciation made use of in the report of the word Lu-

cocytes, giving its derivation from the Greek, together with his views of its pronunciation; gave the successive steps in the formation of organized tissue from the atom, and detailed an experiment showing the power of dessicated corpuscles to reproduce themselves.

The executive Committee reported the following programme:

Hours of holding sessions, from 9 A. M. to 12 M., and from 2 P. M. to 6 P. M. daily, except on Thursday, when there will be no morning session, the time being occupied with clinics; afternoon session same as on other days, and an evening session from 7.30 to 10 P. M.

Adjourned to 9 A. M.

Morning Session.

9 A. M., President in the chair.

The committee appointed at the last meeting to prepare a circular on dental education being called, Dr. Judd said he had no report to make; Dr Dean had not prepared the circular, and did not think Dr. Palmer would be present at this meeting. On motion the time of the committee was extended to the next meeting.

In the discussion of the report on Pathology and Surgery. Dr. Judd said: Dr Atkinson has taken pains to correct my pronunciation of the word Lucocytes; he seems to think it should be Lucocytes; if it were purely a Greek word this would undoubtedly be correct; but being an Anglicized Greek word, it should, I conceive, be pronounced Lucocytes, the plural of Lucocyte.

His description of the blood corpuscles under the microscope was good; his observations, I am inclined to think, were of dead corpuscles. There is some difference between his opinion and my own in regard to dead matter. After certain characteristics which distinguish living from dead matter cease to be, it becomes dead matter. As to the dead dessicated corpuscles being capable of being revived and reproducing themselves, I have my doubts.

Dr. H. S. Chase read a report on Pathology.

Dr. Chase's paper opened with a case of destruction or absorbtion of the alveolar processes, with their subsequent restoration after three months' treatment.

The patient was "aged 19; short, stout body, fat, florid and somewhat coarse complexion, black hair, black eyes. About three years ago she was sick with intermittent fever for a year; does not know whether she took mercury or not."

At the end of that time her gums began to swell, and a discharge of a thin character took place from their under surfaces.

"Present appearance, April 17th: The gums are of a purplish red color, over all the teeth of both jaws; they are everywhere hypertrophied; from their under surfaces flows a viscid, purulent fluid, bathing the teeth and smelling offensively. The teeth are all present in the mouth and undecayed, but very loose. With a flat probe I can pass up under the gums towards the ends of the teeth about half an inch before meeting the alveolar processes, and can pass the instrument entirely around the roots of the teeth."

The patient partakes freely of meats, coffee, pepper, spices, pickles, mustard and salt.

Treatment: Diet to be changed; stimulants forbidden; plain milk food only, allowed. Local treatment by cauterization with "chloride of zinc paste;" viz: chloride of zinc crystals, 60 grs., and powdered Blood-root 15 grs., ground without water to a paste.

Nitrate of silver was tried on the left side of the mouth at the same time that the chloride of zinc was used on the right side, and in the same manner; but after two applications, as the chloride was found to be doing good work, while the nitrate was showing no good results, the latter was abandoned. About ten applications were made in twelve weeks. The paste was carried up on a thin instrument and left in contact with the gums and alveolar process, and roots of the teeth.

There had been no recession at all of the gums This was *not* a case of TARTAR. A hardly appreciable quantity

of some salt was found on the roots at every visit, and was as often removed. At the third visit, this incrustation was put under the microscope, after drying, and large numbers of what appeared to be chloride of soda crystals were seen, together with amorphous granules. The case improved after the second visit, and continued to do so until there was a complete restoration of the alveolar processes, and the teeth had become *tight* again.

At the close of his paper Dr. Chase said: "But the Physiologist can draw no line of demarkation between health and disease;" "only when he observes marked difference between them, can he say, 'this belongs to the domain of pathology, and this to physiology,'" "Who can draw the line between the animal and vegetable kingdoms?" Microscopic research shows that living beings are evolved out of the non living, independently of the influence of living matter;" "the same living matter may grow into both vegetable and animal forms." "Life is an unceasing round of chemical actions, expressing itself in various forms from the highest to the lowest, depending on its surrounding incident forces." Dr. Chase thinks that small-pox, syphilis, scarlet fever, measles, &c., can arise *de novo*, *now*, as well as they could in the *beginning*."

"The *diseased* living matter which has the power to be transferred from one living organism to another, and there multiply by the plasma of the blood which it feeds upon, is not to be distinguished in form or chemical composition from healthy matter." "May not this power to do mischief be owing to the peculiar arrangement of its organic molecules? There are many inorganic compounds having the same chemical composition, precisely, that yet have entirely different forms and powers. This difference in properties is supposed to depend on the peculiar arrangement or juxtaposition of their ultimate atoms."

Dr. Chase thinks that there will yet be a host of new diseases arise *de novo*, or be evolved out of pre-existing diseases, as the conditions produced by social life, density of of population, &c., vary.

He also says: "The future looks bright with the promise that vital chemical changes, both in health and disease, will be as well recognized as those which take place in the laboratory of the chemist." "The physician will then be able to select and apply remedies for disease with as much precision as the chemist can now select elements to form definite compounds, and again to separate the most complex compounds into their elementary individualities."

Discussion.—Dr. Judd—Of the paper to which we have just listened, in relation to the case of absorbtion, I desire to say a word. I witnessed some of the treatment, which was very interesting to me. I have seen several such cases within the past few years. I took pains to examine microscopically the discharges from beneath the gums in this case. I found that when there was but slight appearance of disease, by passing the probe up underneath the margin of the gum I could get pus corpuscles, the result of inflammatory action there. I have used both of the remedies spoken of, and was glad when this opportunity was presented of demonstrating the efficacy of these agents at the same time and in the same mouth. I had a similar case a few years since, which I treated and discharged, apparently cured. In time it returned, and a renewal of the treatment cured again. A slight constitutional disturbance would reproduce the disease. In relation to the microscopical characteristics of the incrustations found on the teeth, resembling the chloride of lime crystals, or whether it was identical with the deposits commonly found on the teeth, I cannot say. The doctrinal points put forth in the paper are very important. The doctrine of spontaneous generation, the evolution of the living from the non-living, is a matter of much moment. The doctrine is an ancient speculation which proved unanswerable till the seventeenth century. Francisco Redi, an Italian physician, was the first to announce the doctrine that all living matter has sprung from pre-existing living matter. It was universally believed that maggots were generated in dead flesh; but

this was disproved, by placing animal body, when quite fresh in a jar, and excluding external agencies by tying fine gauze over the top of the jar, when not a maggot was found, although putrefaction went on as before. The disciples of this old theory have been driven from point to point till they have little left to base their theory upon. I do not believe in the doctrine, neither do I believe it to be the general belief of scientific men at the present day.

Dr. Abbot—This case reported by Dr. Chase is a very interesting one. He does not say that he restored, or thought he restored, the periosteum. When this tissue is lost I do not believe it can be restored. I find teeth loose from hypertrophy of this membrane, surrounding the roots, the result of irritation, produced by the deposit upon the teeth; remove the cause and we cure the disease. It is not necessary to run the chloride of zinc or nitrate of silver up there; nature is her own physician. In my own practice I find nothing necessary but a dressing of carbolic acid. I introduce an instrument under the margin of the gum and remove the dead border of the process, and restoration takes place; making use of a dressing of carbolic acid and water, one drachm of acid to eight ounces of water.

Dr. Walker desired plain, common sense statements, and not vagaries which nobody understood. His treatment in cases of this character was to apply the chloride of zinc diluted with water, equal parts, till the disease was stopped, and then apply carbolic acid.

Dr. Osmond.—I content myself with simply using a wash composed of chlorate potash two drachms, tinct. myrrh three drachms, rose water six ounces.

Dr. Morgan.—We all seem to have our own peculiar mode of treatment in these cases; if this is the case we are the greatest set of empirics the world ever saw. I did not think this could be true, but I now begin to believe it. The periosteum may never be reproduced on the root of a tooth, but I am confident it is in some other localities.

Dr. Herriott.—I am much pleased with the paper. I

think Dr. Abbott is wrong in saying that the periosteum can never be reproduced. I am satisfied that no explanation can be given for the conditions we find resulting from correct treatment of these cases, if we do not recognize the reproduction of this membrane. The systematic treatment adopted in the case reported was the cause of success. We may have different modes of treatment and not be empirics.

Dr. Judd.—I arise to correct certain misapprehensions which seem to exist in the discussion of this case. In this case there was no deposit of tartar, as we find in simple cases of recession of the gums. In this case the immediate cause of the inflammation had passed away.

Dr. Buckingham.—I think the remark of Dr. Morgan, that we are a set of empirics, was correct. What is the effect of chloride of zinc and what is needed in a given case? We must know this if we would work understandingly. You must exclude the parasites before nature can heal the wound. If this is so the chloride of zinc is demanded, or any other anti-septic may be used; nature requires it.

Dr. Stellwagen.—I think we are wandering from the subject. Dr. Chase did not go into the details as to how the chloride of zinc acted; he removed the foreign matter and then used the chloride of zinc to produce a contraction of the space around the roots, so as to exclude the foreign matter.

Dr. Abbott.—I do not think I made a mistake in asserting that the periosteum cannot be renewed. I would like to have Dr. Chase tell us if he thinks it was in the case he has reported.

Dr. Chase in reply to questions.—I used the term atoms in referring to inorganic matter, and the term molecules to organic or living matter. The deposit was soda crystals. I carried the instrument up about five eighths of an inch; not above the point of the root. I did not know whether I removed the periosteum or not, and did not care. I knew the teeth would become firm if I removed the disease.

Bastian has proved that it does not need air or oxygen to produce fermentation. It has been asserted here that Pasteur and others had made the disciples of this doctrine of Bastian's hide their heads. We know that Bastian is sustained by many in the scientific world, and that his experiments go far to prove the correctness of his theory. He partially filled a glass tube with a fluid, heated it up to 300° and then sealed it hermetically. In a few days he found Bacteria and other forms of living matter in the fluid. An infusion of turnips was heated in the same manner, and in a few days Amoeba was found; bits of living matter thus produced develop into monads with tails—tails that will wiggle. No matter if Pasteur does not succeed in obtaining these results; Bastian did not get them in his first experiments. Huxley says if he could look back into a far distant geological age he would expect to see microscopical forms growing out of inorganic matter.

Dr. Judd.—The defense made by Dr. Chase has been as good as could well be made. He has put forth the doctrines and arguments of those who believe in this theory. All of these experiments of Bastian's have been made in the supposition that 300° of heat destroys these germs. Pasteur has demonstrated that this is not true.

Adjourned to 2 P. M.

Afternoon Session.

2 P. M., President in the chair.

Discussion on Pathology and Surgery continued.—Dr. Stellwagen.—Referring to the terms periosteum, peridenteum and pericementum: After inflammation has taken place in the periosteum I defy any one to show me a line of difference between the periosteum and pericementum.

Dr. I. S. Smith, of Pennsylvania, thought root-membrane as good a name as any for this tissue.

Executive Committee report clinics at 8 A. M. to-morrow: Dr. Corydon Palmer, Operative Clinic; Dr. C. R. Butler, Diagnostic and Operative Clinic; Dr. W. Atkinson, Diagnostic Clinics.

Report on Therapeutics by H. L. Sage.

In speaking of the phosphates he said: The French physicians claim that the lacto-phosphate of lime is the form most readily taken up and appropriated by the system. When the gastric juice is concentrated it readily dissolves the phosphates. This remedy would seem to be specially indicated in cases of females during the periods of gestation and lactation, when the stomach is in a feeble and irritable condition. There are two classes of theorists in regard to the use of lime salts, one recommending the use of the phosphate in cases where there is a deficiency in the lime salts, and another would use the lacto-phosphate. The following formula for a syrup of the phosphate was recommended: Acid phosphoric dilute U. S. P. q. s., phosphate lime, fresh precipitate, q. s. Dissolve the phosphate of lime to saturation in the acid, filter, and add an equal quantity of pure glycerine or sugar—the glycerine is preferable. In case of anæmic condition, phosphate of iron may be added with advantage, also made tonic by the addition of sulph. quinia. Register 71.

In cases of retarded dentition it is especially indicated. This should not be confounded with checked development, as there is a great difference between these conditions in cause and result.

Another direction in which the lacto-phosphate seems to be indicated is in cases of irregularity in the dental arch; in many of these cases there seems to be a want of lime salts, and in correcting the irregularity constitutional treatment is indicated. The administration of the lacto-phosphate furnishes lime for filling up the spaces formed by the side of the root changing its position.

A new agent (pepsin) has been suggested for use in the treatment of dead and partially decayed pulps, by Mr. Oakly Coles, of London

In alluding to the injurious effects of certain remedies on the teeth, he stated that acids which are known to have a very injurious effect on the teeth are frequently administered

without proper care. Remedies containing potash, as bromide of potassium, have greatly impaired the teeth when long continued. A case came under my observation where this remedy had been taken for one year. The teeth were found very much denuded. When the saliva is acid the salt is decomposed and bromic acid is formed, which is very destructive to the teeth.

Carvacrol.—In referring to this agent the writer stated that carvene, carvol and carvacrol are products of the essential oil of caraway, which is isomeric with the oil of turpentine. The oil of caraway consists of two liquid oils; one a carbo-hydrogen called carvene, C 20, H-16, and the other composed of carbon, hydrogen and oxygen, C-20, H-14, O-2, and named carvol, the boiling point of each being respectively 343° and 472°, Fahr. When the oil of caraway is distilled from hydrated phosphoric acid, the distillate being poured back into the retort until it ceases to have the smell of caraway, the product is an oily liquid called carvacrol, having a disagreeable odor and a strong, acrid and very persistent taste. (U. S. Dispensatory, 18½ page 1304.) Carvacrol is obtained by treating oil of caraway with potash, or again by treating the same oil with iodine, cohobating several times, and washing the product with potash. Thus obtained it is mixed with carvene. Carvacrol is also found among the products of the action of iodine on camphor. Carvacrol, when pure, is a colorless, viscid oil, lighter than water, in which it is nearly insoluble. The odor of carvacrol is like that of creosote; taste, persistent, strong and biting. It is a mild antiseptic, carminative, sedative and stimulant. Combined with water it forms a very pleasant and efficient gargle for tonsellitis. Also, as a mouth wash, it is very excellent. In cases of odontalgia, from an exposed pulp, it is singularly adapted, its application giving almost instantaneous relief. It is useful for rinsing the nerve canals and as a dressing in cases of alveolar abscess. It does not produce as much inflammation in the surrounding tissues, when applied through the canal, as creosote or carbolic acid,

and yet it makes itself more severely felt. Oxychloride of zinc is the best material for a temporary covering of this substance, as Hill's stopping, or gutta percha, is speedily dissolved by it.

DISCUSSION.—Dr. Atkinson.—The assertion that carvacrol is better than thymol as a disinfectant, or as an agent for obtunding sensibility is unwarranted. The shock produced by the glycerole of thymol is due to the glycerine. There is no shock where there is no excitation. Pure thymol produces no pain. If we forego the pain attending the application of the glycerole of thymol we shall have an agent that meets the case as a disinfectant and obtundent of sensibility. I first used creosote, then thymol, and now carvacrol. As a substitute for creosote, carbolic acid and thymol I am not prepared to accept it. They are all good and similar in character, the carvacrol being the mildest in its action. In reply to a question: Pepsin will not dissolve anything: under a certain kind of stress it stands there and enables water to dissolve the albumen. I endorse Mr. Cole's method of using it. Apply it and it will wash away the decomposed nerve.

Dr. Taft uses the pure dried pepsin, forming a paste with the liquid preparation. Has used carvacrol and finds it good —thinks it promises much. The subject of therapeutics is far less understood and is receiving less attention at our hands than the operative and surgical branches. This is to be regretted. There is very much that pertains to this branch of medicine that is of vital importance to the dentist, and should be better understood. An attempt has been made to simplify the knowledge necessary for the proper administration of most of the principal remedies by putting them up in convenient form, ready for use, classified and so marked that the amount given is always indicated. Opium, for instance, is combined with gelatin in thin sheets, and so marked that a large or small portion can be used as desired. All non-evaporating medicines are prepared in this way.

On motion of Dr. Rehwinkle, it was resolved that the

Committee on Therapeutics investigate the difference of action between creosote, carbolic acid, thymol and carvacrol, and indicate symptoms or peculiar conditions under which one of these agents is preferable to the others.

Dr. Stellwagen uses alcohol perfumed with cologne as a disinfectant and dressing for root canals. Thinks it is not necessary to use any thing else—too much stress is put on this question of proper remedies for the treatment of diseased dental tissues. In reply to a question: He never uses chloride of zinc in filling a root canal at the apex; sometimes uses cotton saturated with carbolic acid, sometimes gutta percha, and sometimes gold.

The subject of Therapeutics—passed.

Dr. J. B. Hitchcock, Chairman of the Committee on Histology and Microscopy, made his report.

Commencing with the development of the teeth, the writer gave the successive steps in the process of the development of the teeth, from the primitive dental groove to the fully developed organ. As this portion, as well as the concluding portion of this report, which was devoted to the histological structure and microscopical appearance of calcific deposits found in the pulp canals of human teeth and the teeth of animals, was mainly descriptive of a series of photo-microscopical plates which the author had prepared, we are not able to make any extended report of it. We hope arrangements will be made for supplying the publishing committee with copies of the plates, to accompany the report in the published transactions.

Dr. Taft introduced Dr. Eastlake, resident dentist from China.

Dr. Judd.—In relation to these calcific deposits and new formations mentioned in the report on histology: These formations are sometimes continuous with the dentinal structure, at others connected only with the pulp chamber or nerve canals. There is a characteristic difference in the structure of these formations, apparently dependent somewhat upon their locality. Those found in the pulp chamber

approach more nearly to the tooth structure than those connected with the dentine. I have seen specimens containing well developed dental tubes; others seem to possess no characteristics of the dentinal structure. A recent specimen which I prepared and examined, had all the appearance of dentinal tubes arranged in regular order, and as distinct as I have seen them many times in a healthy tooth. The influence these deposits have upon the dental pulp is various, many times causing intense neuralgic pains. These nodules in the pulp chamber are found quite frequently in perfectly sound teeth. In reply to Dr. Taft: I would open the nerve chamber and remove the nodules, treat as in simple exposure, or remove the nerve entirely and fill. Sometimes these formations extend up into the canals, making it very difficult to remove them.

Dr. Morgan.—As Dr. Judd has said, these nodules are frequently found in the nerve canals, and I think I have noticed that the pain consequent upon their presence is more acute when the nodule is connected with the dentine than when connected only with the nerve.

Dr. Atkinson.—I desire to congratulate this body upon the direction that thought and investigation is now taking. There seems to be a manifest desire to seek out and know the source and cause of things in nature.

The hypertrophy which has been spoken of as being present in the cementum of a tooth, is due to the want of occlusion of this tooth with its fellow.

Dr. Chase has specimens of dentinal tubes extending half way up to the surface of the enamel, and several specimens of calcified pulps; also a specimen of decalcified crown of a tooth in which there were osteal cells at the end of dentinal tubes.

Afternoon Session.

2 P. M. In the absence of the President, Dr. Morgan was called to preside.

The following resolution, offered by Dr. Walker, of New Orleans, was adopted:

Resolved, by the American Dental Association, convened at Put-in-Bay, that the recent action of the railroad combination, in refusing to make any reduction in fare, as far as it applies to dental, medical and scientific associations, is not only uncalled for but highly reprehensible.

Resolved, That gentlemen who attend such associations as delegates, do so at great personal sacrifice for the benefit of humanity and the general public good, and that their influence tends greatly to advance the interests as well as the area of civilization, and thus confer such positive benefit upon railroads (which depend upon the increase of civilization for their welfare,) that they can well afford to pass such members and delegates both to and from their places of meeting, and that their refusal to grant at least return passes, is laying a tax which they are illy able to bear, upon men who devote much time and labor without compensation for the public good, and is as short sighted as it is arrogant and selfish.

Dr. Atkinson read a volunteer essay on Histology. This was an able paper, and we regret that we have no report of it. After the reading of this paper the subject of Histology was passed.

By request of the association, Dr. Eastlake gave a brief history of the status of dentistry in China and Japan. The speaker said: You cannot expect me to give you a very favorable report of the status of the profession in this hotbed of superstition, or that I can give you anything new, isolated as I have been for twenty years. I arrived in Hong Kong in 1853. I found dentistry at a very low ebb. The inhabitants, a superstitious people, educated to believe in charms and necromancy, did not appreciate dentistry. Since I first landed there has been a great change in the character of the inhabitants—brought about mainly by the English with whom they have had intercourse. It would be difficult to find a country where dentistry is more appreciated than it is in Hong Kong at the present day. I have had as patients, representatives of all the Eastern nations. I have had the

same difficulties to overcome that you have in the treatment of diseased teeth. The Chinese dentists are a set of charlatans, jugglers and mountebanks, who work upon the credulity of the people, extract teeth without pain, and perform instantaneous cures through the aid of necromancy. I was dependent upon my own resources—made my own instruments and outfit. To give an idea of the Chinese dentist, I will relate an incident: Some of my patients desired to know how it was that the native dentists were able to extract teeth without pain, and how they removed the worm from the tooth which they were taught to believe was the source of pain. That I might be able to answer some of these questions, I visited a dentist. I found him in his tent, or under his umbrella, in front of the temple of horrors. Around him were a throng of natives, afflicted with all manner of diseases. The dentist received me kindly, exhibited his instruments, and showed me his method of operating. By close observation I learned many of his tricks. When a patient presented himself to have a tooth extracted, the dentist placed around the tooth upon the gum, a white powder, which he said was the extract of the blood of the horse. The patient then left to return again in a few days to have the tooth removed. When he returns, the tooth being loose, is readily removed without force or pain. The powder used was arsenic. To learn the maggot or worm trick, I was compelled to take one of his instruments used for removing the worm. It resembled a pair of forceps. I found one side of the instrument to be of bamboo, which was hollow; in the hollow were secreted the maggots. The dentist would examine the aching tooth and pronounce it a case of worm in the tooth. Taking his magic instrument he would apply it to the tooth, at the same time forcing one of the maggots out of the bamboo side into the cavity. The patient would then be exhibited to prove the correctness of his diagnosis. Another application of the instrument and the worm was removed and the patient sent away cured. Those engaged in the manufacture of artificial teeth are very dexterous in

carving. Their shops are located along the streets, where they are at all times prepared to insert one or more teeth at short notice and for a small fee. The patient is placed on a table and a piece of ivory or hippopotamus tusk is selected and carved to fit the space, and to resemble a tooth; it is then attached to the natural teeth by means of copper wire. I have seen specimens of this work which had been worn for years. A man in Yeddo carves plates for sets of teeth from a hard wood, resembling mahogony; human teeth are then attached to these plates by means of rivets. Colleges and schools are to be found all over Japan. The teeth of the Japanese are of a superior character—much finer than our own. The better class are very cleanly—to keep their teeth clean is part of their religious duty. They perform this duty every morning and night, before going to prayers. They first clean their tongue, then their teeth, and then say their prayers. To clean the teeth they use a piece of wood with a powder made from the cuttle fish. Caries is not common except among the coolies.

The following resolutions, offered by Dr. Rehwinkle, were adopted:

Resolved, That this Association, recognizing and appreciating the liberality of the Cincinnati, Hamilton & Dayton, Michigan Southern, Cleveland, Columbus, Cincinnati and Indianapolis, and the Short Line railroad from Louisville to Cincinnati, in granting round trip tickets to and from Put-in-Bay to members and delegates of the American Dental Association, hereby expresses its sense of obligation to the above named roads.

Resolved, That in view of the fact that an urgent necessity does exist to supply the army and navy of the United States with competent dental surgeons, it is hereby proposed that a committee of three be appointed to secure the co-operation of the Surgeon-General of the United States army, and if needful of the Congress of the United States, to make provisions for the appointment of dental surgeons in both army and navy.

DENTAL CHEMISTRY—Dr. Webb read a report on this branch, mainly devoted to the physiological action of anæsthetics. It was a good paper, and we regret that we can not give our readers a synopsis of the writer's views.

Dr. Atkinson, referring to the paper, said: The deprivation of oxygen is the cause of anæsthesia. Functional action does not take place in statical tissue. I wish some one would speak on the subject of chemistry directly, we should then have something on crystalography; something upon which we might learn a thing or two of calcification and absorbtion of the teeth.

Dr. Buckingham.—That all anæsthesia is the result of the want of oxygen is an old theory. If it were true, then we might give hydrogen, nitrogen, or any other gas which has no oxygen. I think anæsthetics act by being passed through the blood and being absorbed, and so act upon some of the functions of the body as to deprive them of the power to act. I know not how.

Dr. Webb was asked by Dr. Atkinson if he understood him to say that the blood corpuscles have a sac; if so, he would advise him to investigate the matter for himself, and not take the say-so of others. He doubted it.

Dr. Atkinson was asked if his theory be the correct one, how he would account for the anæsthetic effect of mesmerism. In reply Dr. A. said, "mesmerism affords the best evidence that can be adduced in support of this theory. In the mesmeric act the mind must be kept fixed and at rest; respiration and inspiration are gradually arrested, and a general cessation of feeling and sense ensues. Awaken the mind, restore the function of respiration and inspiration, and general restoration soon takes place. Mrs. A— had the power for three days, and everything that could be done was done by physicians to awaken her, but without avail. A brother in the church suggested that they give her a song of Zion; it was tried, and sister A— was alive in no time."

Dr. Summers.—I do not believe it is the deprivation of oxygen that produces anæsthesia. In fact, I know it is not.

If you take oxygen from the system you do not produce anæsthesia. Alcohol has been suggested here as an agent for cleansing root canals We have no better disinfecting agent than pure alcohol. I use it in the laboratory for this purpose. For preserving meat from putrefaction and maggots it is the best thing I have found. With reference to the action of acids and alkalies upon the teeth in the mouth, I am still of the opinion that the alkalies are the most destructive agents. They act upon the pabulum, taking away the base. The presence of acids does not prove that they are the cause of decay. There is nothing so destructive of animal life as the alkalies. Hydrochloric acid acts slowly upon the teeth, but we do not carry enough of this acid in the mouth to destroy the teeth.

Dr. Buckingham.—Alkalies may destroy the teeth by overcoming vital force and by causing the elimination of an acid destructive to the teeth. Alkalies will not destroy a tooth if immersed in them.

Dr. Summers.—These alkalies enter the blood vessels, thus coming directly in contact with the tooth substance through the local circulation, and so destroy the pabulum of which the tooth is formed.

Dr. Taft.—Why does it not act upon other bones and tissues, if it goes into the blood?

Dr. Summers.—It goes into the blood at a point immediately surrounding the teeth, through the corpuscles, and destroys the pabulum.

Dr. Taft.—I apprehend that any agent passing into the general circulation would affect the general system. The teeth do not get their supply of nourishment from the corpuscles immediately surrounding them.

Dr. Atkinson.—I think the truth will be found in the mean between the two theories. Alkalies enter the tooth at the distil end of the tubuli and interglobular spaces, and act upon the tissue. Its affinity for the pabulum causes it to attack the teeth in passing the interglobular spaces, being attracted by the pond of supply.

Dr. Osmond.—I have observed the evil effects of alkalies on the teeth. By the constant use of baking powders and soda the phosphates are eliminated and the pabulum destroyed. In tuberculosis the phosphate of soda has been found to be of great service. The rationale of this treatment being to supply the waste of the phosphates. Baking powders rob the system of the phosphates and render the secretions acid, thus destroying the teeth. Sozodont should not be used. If we wash our hands with soap repeatedly and thus remove the cuticle, it will be reproduced; but if we remove the corresponding tissue from the teeth, it cannot be restored.

Dr. Douglass.—I prescribed iodide of potash for a patient; after taking it some time the teeth became very sensitive, and the gums commenced receding. The use of the remedy was discontinued and the local trouble disappeared. The same patient took bromide of potash recently, and the difficulty with her teeth and gums returned.

Dr. Osmond.—I would recommend the application of nitrate of silver for this sensitive condition of the teeth; two or three applications will cure the disease. It will blacken the teeth but it renders them harder. I have good success with this remedy. To apply it I make a small disk of paraffine, and drop a drop of the nitrate of silver into it. I use a common tooth-pick to apply it with.

Dr. Buckingham.—A wire of silver placed in nitric acid and applied at once, gives you the nitrate of silver in as convenient a form as possible.

Dr. Hitchcock.—Teeth with perfect enamel are not affected by the alkalies. If decayed or denuded of enamel, the alkalies may render them sensitive. I have a tooth which has been immersed in a solution of soap for two years, without the least change—at least in the enamel. I have used soap in my own mouth for years, with no unpleasant effects. I recommend it for my patients. I have used the nitrate of silver when there were symptoms of decay, teeth sensitive, not much softening, applying it only to the defec-

tive spot. I use the solution, and apply it with a stick, following it with a solution of the carbonate of soda, to destroy the metallic taste. Chloride of zinc has been used in similar cases, and is good. The teeth of females are frequently sensitive during the period of gestation, especially about the necks. If we apply litmus paper, we shall find the secretions at this point acid. Excavating gives pain. The bicarbonate of soda, one half teaspoonful, given three times a a day will remove the trouble. The sensitiveness will disappear and the teeth can be excavated with little pain. I would only fill the teeth temporarily during these periods.

Dr. Hunter.—Alkali, if I understand Dr. Summers, destroys the framework of the teeth, and allows them to break down. This is contrary to the recognized theory that the cause of decay is external and not internal. I have never seen a case where I thought the cause was internal.

Dr. Rehwinkle.—If Dr. Summers' theory be correct it is certainly very important, and a great boon; for if the capillary system possesses the power of absorbing any agent, and of carrying and applying it to any specific organ, we have a powerful adjunct in overcoming disease.

Dr. Summers.—I hope no one thinks I am so ignorant as not to understand that any substance introduced into the circulation traverses the entire circulating system. Still, might not a substance be introduced into the capillaries around the tooth, so affect the blood that goes to nourish the tooth as to affect the tooth structure?

Dr. Buckingham.—But the tooth does not get its nourishment from the external vessels surrounding it, but from the blood. I use alkalies to destroy the sensitiveness of teeth; I have used caustic potash.

Dr. Stellwagen.—I have tested case after case, and have never found one where the secretions showed an alkaline reaction. I understood Dr. Summers. I fully understand the osmotic action alluded to. There is this action going on, but I do not believe the alkalies produce any effect in this way upon the teeth. I have said that we could preserve our

patients' teeth if we could keep them clean, and the saliva alkaline. I announced this at Nashville, and believe it still. Use chalk around the teeth at night, and give lime-water and milk to correct any tendency to acidity. I have adopted this course in my own family, and when we neglect it for a little time decay runs riot.

Dr. Whitney, Honolulu—Burials in the Sandwich Islands were formerly made in caves. These burial places are accessible, and in them may be found the skeletons of former generations. At the time these burials were made no acid fruits were to be found in the islands.

They have since been introduced, and the date of their introduction being known, it occurred to me to make some examination of the skulls and teeth of those who died before and after the introduction of the acid fruits, and institute a comparison between them, with a view of ascertaining, if possible, the effect, if any, that the use of acid fruits have upon the teeth. I found on examination that decay was present before the introduction of acid fruits, but not so marked as it is now, and has been since their introduction. I find a gradual increase of decay with the increased use of acid fruits.

Dr. Forbes.—There is nothing more troublesome and annoying to the dentist than sensitive dentine. There are very few of us who can say to our patients as Dr. Arthur says he does: "If you do not eat and drink as I direct I will not treat you." We have had alkalies, caustics and acids recommended to-day, for obtunding sensibility. I have used alcohol with common chalk, and I find in its use all that has been recommended, for it is well known that manufacturers put nitric acid in their whiskey. This is my tooth powder: prepared chalk and alcohol. The more simple the injunctions the more likely they are to be carried out. My patients get married and their teeth are improved.

Dr. Druylass.—I do not believe that alkalies, in small doses, will produce recession of the gums, or decay of the teeth; but given in large doses, or for a long time, they may

produce these conditions. Sour drops will produce periden-tal gingivitis. When produced by alkalies, use nitric acid in high dilution; when from acids, use potash in the same manner. Subject passed.

Dr. Hitchcock opened the subject of operative dentistry with the details of several cases of torsion. He said: There is an operation which has been performed in Europe frequently, which is worthy of our attention. I refer to torsion as a means of correcting the irregularities of the dental arch. The method of performing this operation is pretty fully described in Tomes' Dental Surgery—second edition. It should never be attempted during certain febrile conditions. There should be plenty of space to turn the tooth without impinging upon others. It should be done soon after eruption, before the root is fully formed; if not done then there is danger of constricting the vessels. Between the ages of 9 and 12 years is the most favorable age, although it has been done at a later period. Our English brothers do much of this work. If much change is required in any given case, but one half is done at the first sitting; in a few days the patient returns and the operation is completed. The Dr. exhibited models of several cases in which he had performed this operation; all successful save one, a hospital case, in which there was no plate used to retain the tooth in position. A pair of straight incisor forceps with sharp edges, is the instrument used in this operation. Bits of crocus of sand paper are placed between the beaks to protect the tooth; chamois skin or tea lead will answer the same purpose.

Adjourned.

8 P. M., Thursday. Dr. Morgan in the chair.

The first order of business, the selection of a place for holding the next annual meeting, was taken up. Several places were named as suitable, and were balloted for. Detroit receiving the greatest number of votes, was announced as the place selected for holding the annual meeting in 1874.

The election for officers to serve the ensuing year resulted as follows:

President.—Dr. T. L. Buckingham. .

First Vice-President—Dr. Isaiah Forbes.

Second Vice President.—Dr. A. F. McLain.

Corresponding Secretary.—Dr. Jas. Taft.

Recording Secretary.—Dr. M. S. Dean.

Treasurer.—Dr. W. H. Goddard.

Executive Committee.—Drs. Field, Thomas and Cushing.

Publishing Committee.—Drs. H. A. Smith and George H. Cushing.

STANDING COMMITTEES.

Physiology.—M. S. Dean, E. A. Bogue, A. W. Harlan.

Pathology.—H. Judd, H. S. Chase, C. C. Knowles.

Histology and Microscopy.—J. B. Hitchcock, C. E. Latimer, J. Taft.

Chemistry.—H. A. Smith, C. R. Butler, W. T. Wallace.

Therapeutics.—T. C. Stellwagen, L. Jack, J. McManus.

Operative Dentistry.—L. D. Shepard, G. C. Dabott, G. L. Field.

Mechanical Dentistry.—S. B. Brown, J. F. Canine, E. D. Swain.

Education.—A. F. McLain, E. J. Waye.

Literature.—W. H. Eames, Chas. Baffett, P. G. C. Hunt.

Etiology.—J. H. McQuillen, M. H. Webb.

Prize Essays.—Isaiah Forbes, W. H. Goddard, G. F. S. Wright.—*Missouri Dental Journal.*

ARTICLE II.

Physiology of the Dental Structures.—Concluded.

BY S. P. CUTLER M. D., D. D. S.

Although the hepatic functions cannot be said to be directly vital, still they have great influence on all vital acts; unlike the brain, heart and lungs, the great vital tri-pod, the hepatic functions may be suspended almost entirely for a time, without necessarily proving fatal; not so with either

of the three vital centres, the functions of which cannot be entirely suspended for any length of time without fatal consequences. There are cases where the functions of one of these three organs may continue after the normal action of one or both of the others are suspended: as an instance, the heart may continue to beat after respiration has been cut off mechanically or otherwise, as in cases of hanging, drowning, or mechanical obstructions in the wind pipe, by swelling, or foreign bodies, and life recovered again, after it had apparently gone out; there are instances of suspended animation or apparent death. Although the vital functions of the heart may be said to be mechanical chiefly, still this mechanical function can not be suspended for a single minute without fatal results. Respiration, in *modus operandi*, may be said to be mechanical, although other important attributes are embraced in the respiratory processes, as the taking in of oxygen, and giving out carbonic acid and watery vapor, by both mechanical and asmatic action.

In some of the lower order of animals, æration takes place without any respiratory act; not having genuine lungs, still lung functions are carried on as in higher animals. In some others there is neither true circulation, respiration, or brain function, there being no true organs of either, still organic or vegetative life is carried on.

Man, in addition to all other functions common to all the lower animals, has the additional cerebral functions of a higher intelligence, space not permitting any detail. In a physiological point of view, mind may be regarded as functional, though altogether different from all other functions.

The three great vital centres all have their characteristic functions, when taken collectively; ramify so as to embrace all other collateral functions, not regarded as vital, *per se*, only relatively so; as the three great vital centres embrace all others. Whether we regard the mind as a function of the great nervous centre, the brain, or not, we can only discuss it as such in a physiological point of view. If we regard it as the result of evolution and growth, as any other

function, we can readily comprehend the pathological condition when the brain is diseased, either curatively or hopelessly so, but if we view the mind as ultra physical, or an independent entity, then we have no scientific stand point of discussion. The brain has other and important functions besides mind to supervise; coming to the senses, we must look upon all knowledge as sensual, as there are no other channels through or by which any kind of knowledge can be derived; hence, knowledge is a thing of education, and governed greatly by surrounding circumstances.

If mind or knowledge be regarded (on the other hand) as super sensual and inate, then we know but little about it. All the impressions through the senses may be looked upon as so many greater and smaller waves or rythms; such being now demonstrated as the order of nature. All the dynamics of the unions consists in dynamical waves, of greater or lesser extent, and physiology forming no exception to the rule.

Let us turn our attention for a short time to the circulation of the blood; the circulating mass is confined within a system of circulatory vessels, the heart being the centre, there being no stopping point of rest anywhere in the entire rounds, because to stop, to pause is to die; hence, this function is a perpetual motion, never beginning, nor never ending, no terminal or halting point, as in case of respiration. So far as the physical aspect is concerned, the movement of the blood is mechanical, or its mechanical function. The heart, arteries, capillaries and veins, are mainly muscular or fibrous throughout, and by muscular contractility mainly, the function of circulation depends. Let us look into the circulation for a few moments: first, the heart's contraction upon the filled ventricles, supposing the vessels all full; the heart contracts and diminishes in size, and empties its chambers, forcing the blood into the arteries with such a force, as to considerably dilate them, at the same time the blood is driven forwards into and through the capillaries, into the veins, and through them back to the auricles of the heart,

at each systale, facilitated by the capillaries and arteries. As the heart contracts, there is no general lessening in the mean dimensions of the system, of the circulation; as the heart lessens, the arteries expand in due proportion; as the heart opens or dilates, the vessels contract in turn to the amount of the heart's expansion; so that this constant ebb and flow is just self-compensating, and constitutes one complete circulatory wave.

The experiments made by Volkman with his hæmadrometer, on the velocity of the circulation, showed it to be about 300 millimetres a second, or nearly 12 inches; the velocity near the heart is greater than more remote, and much slower through the capillaries than arteries. A thorough knowledge of the circulation is of incalculable value to the practitioner of medicine, more especially in all acute diseases. When the finger is placed on the radial artery, certain pulsations are felt, an ebbing or flowing, a swelling and diminution in calibre felt, as though some foreign body was passing under the finger. The length, size and density of each pulse, is the chief monitor in diagnosing acute diseases; it speaks a silent but intelligent language. It is the education of the finger ends that interprets the secrets of disease known only to science. In heart diseases, much knowledge is gained by oscultation, by training the ear.

Next in order of vital functions, comes the physics of respiration. Let us notice the tidal ebb and flow of the chest during inspiration and expiration, the expanding and contracting of the chest some eighteen more or less times in a minute, like the number of pulse, varying in different individuals and at different ages in the same person, in health and disease. In the act of inhalation the chest is raised upwards and expanded by the action of the inter-costal muscles, and the diaphragm straitening or flattening out, pushing out the abdomen. Ordinarily in this act, the chest is increased, and takes in from fifteen to thirty cubic inches of air, which may be voluntarily increased many times this amount. The respiratory act is known as the respiratory wave.

There is a much larger amount of residual air contained in 600,000,000 of air vesicles, that can never be forced out by any effort of the individual; the amount so residing varies in different individuals; in some, being from seventy to one hundred cubic inches, sometimes over, and sometimes under this amount. In diseases of the lungs, the amount varies very much. Right in these air cells or vesicles, takes place, intermixture of gases and asmatic passage in and out of the circulation of vapor and gases; within these vesicles no important chemical change takes place, though changes of great vital import.

The pulmonary capillary vessels everywhere surround these air vesicles, hence, are much more numerous than the vesicles themselves. As the chest rises and falls, there is necessarily a displacement of atmosphere in both cases that just equals each other, hence there is no lifting either way in this apparent displacement: otherwise, fatal collapses might result.

The bulk of food and air taken into the body in twelve months, is given out again in just about equal bulk, there being no essential difference, so that what is taken into the body and given out again, has undergone important chemical changes without any material change in volume. This chemical change has been all important to the individual *vis viva*, having been developed just equal to the amount of dynamical disturbance needed; a perfect system of correlation or conservation forces having existed when the balances were unbroken, which means physiology, and when broken, means pathology. The sum of life, then, consists of a system of chemical and physical forces, always vibrating in harmony with themselves and the outer world, being at the same time part and parcel of the universe.

Reproduction comes under the head of normal physiology, and like crystals, prototypal forms are reproduced, as when any crystalline salt is dissolved and re-crystalized, the same type as the original is reproduced under like circumstances; these are called typal forms.

Prof. Agassiz has been lecturing on eggs, and he asserts that "all living beings, whatever their diversity of form, have grown up from eggs, which are at first all precisely similar, deviations take place, little understood, that eventually change these beings into widely different animals." The editor remarks, "this explains where every thing comes from, except eggs."

In conclusion. The main object in taking food and air into the system is for the purpose of keeping up a supply of force, which is being constantly expended by vital and chemical changes going on, and when food is withheld, or rendered unavailable, as during sickness, chemical changes still go on in the body at the expense of vital force; hence, debility, requiring suspension of voluntary motion in proportion to vital exhaustion.

When persons die from starvation, they die mainly from *inanition*, and syncope ends the career, similar to that of hemorrhage when air is withheld, apnœa or asphyxia follows. Longevity or old age may be regarded as a loss of balance in the forces, the chemical gradually gaining a predominance over vital or nutrition, and the individual really becoming a fossil, so to speak, death being the grand climax in life's drama. Food and air enter the body as living factors, carrying in potential energy by oxidation, which becomes dynamical force, or *vis viva*, then leaving the body as dead matter, *so-called*, having done work, and died in giving life to the body.

ARTICLE III.

Honor to Whom Honor is Due.

BY W. F. FUNDENBERG, M. D., PITTSBURG, PA.

In the last edition of Dr. Garretson's "*System of Oral Surgery*," I was surprised to read a full and extended notice (occupying four pages) of Dr. S. P. Hullihen's great plastic operation performed upon Miss S——, of Newark, Ohio, without giving any credit whatever to the operator.

Surely if the operation was worthy of being qtuoed as an illustration of what plastic surgery is capable of doing in apparently hopeless cases,—the common courtesy due from one gentlemen to another required that the author's name should at least be given.

That Dr. Hullihen has been called from his labors by the stern messenger who will soon call all of us to our account, and that he is therefore unable to protect his reputation, does not make the matter any better. And while upon this subject, permit me to refer to another matter in justice to Dr. Hullihen. Dr. Garretson, in speaking of pressure applied to bring the jaw together in fissure of the hard palate, remarks that he had supposed that he (Dr. G.) was the originator of the idea himself, but states that he found in the "*Cosmos*," an extract taken from the "*Australian Medical Record*," in which the writer says that the plan was first presented to his mind in 1851.

Now it can easily be proven that Dr. Hullihen in 1841 suggested the idea of bringing the jaw together by pressure, (his method having been by adhesive straps,) and published his ideas in pamphlet form and in the journals. And although Dr. Hullihen called attention to the necessity of applying pressure during infancy, (the earlier the better in all cases of hare-lip with fissure of the jaw,) not only to prevent deformity, but also to simplify the operation upon the lip. I am surprised to see that not one surgeon in a hundred ever thinks of this method, so easily applied, and so excellent in its results, but suffers the patient to grow to adult years, and then attempt to remedy the defect with an obturator.

SELECTED ARTICLES.

ARTICLE IV.

Dental Physiology.—Concluded.

BY HENRY S. CHASE, ST. LOUIS.

I have sufficiently spoken of *natural* food. I repudiate all inorganic chemical food from the laboratory of the chemist; it is a fallacy to suppose that *artificial* lime salts will produce the desired results. Only so far as they may act medicinally to improve digestion and assimilation will they be of benefit. Nature will reject them as *factors* of nutrition, as the urine and fæces will show.

That particle of phosphate of lime which is intended to become a portion of bone or tooth must first have received a certain degree of vitality or life by the wonderful force of the vegetable cell before it can become a living portion of the animal cell. No! follow nature! give the food which she so bountifully provides for her children, and she will respond to your endeavors by granting your earnest desires.

The custom of feeding babes with starchy and gummy substances is both unscientific and practically injurious. Starch produces fat; gum is not digested at all.

It is the *fashion* to fatten babies, mothers undoubtedly thinking it a true indication of perfect nutrition. This is a great error. True health consists in the normal performance of every function of the body, and this can take place quite as successfully with a small amount of adipose substance as with the system burdened with it. Indeed excess of fat is not normal but rather pathological.

Children should not be *fed* at all, if possible, until nature has given a hint for additional food by the eruption of the incisor teeth. Then lean meat is preferable to vegetable food, and will be found of easier digestion.

The eruption of the milk teeth is a period full of dangers to the health and life of the child in civilized life. Leaving out the catalogue of contagious diseases, nearly every other ailment may truthfully be laid to the violated laws of hygiene; or the inherited latent diseases of scrofula and syphilis. The ignorance of parents on this subject is terrible; causing a destruction of life which is painful to contemplate.

The eruption of the teeth being a physiological process as innocent digestion, should not bear the obloquy which is so universally and erroneously attached to it. I cannot discuss this subject upon which I feel so much interest, because it would carry me far beyond the limits which I had prescribed in this paper, and I will therefore only say that I believe that almost every one who will give enlightened thought carefully and patiently to this question will come to similar conclusions with myself.

The violated laws of infantile hygiene, and the diseases which are forced upon the innocent being by the sins of others, retard and complicate the process of eruption to an alarming extent. Extending as it does over so many months, with the teeth in such variety of stages of progress towards growth and dentification, and absorption of the gums to admit of the passage of the crown, these diseases are constantly interfering with the beautiful cellular changes which are necessary to carry them all through to perfection. And it is indeed wonderful, and a cause for our hearts to swell with gratitude to our Creator that He has made nature so persistent, so patient in endeavoring to accomplish her good work, notwithstanding the ignorant and provoking interferences of vain man.

The treatment of infantile diseases then should be entered upon with the understanding that the eruption of the

teeth is not the *cause* of any of them ; and that the welfare of the dental organs imperatively demands that all pathological conditions of the body should be as quickly removed as possible, that nature may be able to continue her wonderful work of dentification and eruption.

In regard to the process of eruption itself there is danger of too much meddling. We are too apt to think that nature is incompetent for the proper performance of her work, and therefore, many of us cut the gums of the little innocents at the beek of any ignorant mother or nurse in charge, without regard to condition.

The gums ought not to be cut, whether sick or well, unless there is distinct swelling or inflammation. If it is for the liberations of a tooth we must be sure that it has sufficiently advanced and that there is an upward pressure which cutting will relieve. If to relieve congestion, only the mucous membrane or the gums should be cut. Deep cutting is not only dangerous to the mechanical texture of the tooth, but also to life. Fatal hemmorrhage has often been the result of deep incisions. The supply arteries are large in proportion to the tissues which they are so busy now in feeding, for where there is so much to build there must be abundance of material.

If there are any who consider that infantile diaease is a subject beyond the limits of the dentists sphere, I beg them to remember that nothing is beyond the legitimate sphere of an *educated* and *intelligent* dentist, who desires to see the beautiful works of God restored to that place in the temple of nature where He first placed them in His infinite love. To this end let us all strive until we shall no more hear the impious remark, so often made in our offices, "Why did not God make the teeth to last as long as our lives?"

ERUPTION. This physiological process occupies from about the seventh to the thirtieth month for the fisst or milk teeth This is certainly a very interesting and important period in the child's life. The mortality of children at this time of

life is enormously out of all proportion to other periods, and is indeed frightful to contemplate. My views in regard to the dependence of infantile diseases upon the process of eruption have already been expressed. Hygienic measures of the very best kind should be adopted to bring the child of civilization, and perhaps the heir of hereditary diseases inimical to the highest attainment of bodily perfection, into such relations with natural laws, as will best neutralize all those untoward influences which render the thread of an infant's life brittle and uncertain.

The mother's milk is one of the most important things to be looked after, and one, too, almost entirely neglected. It is impossible to make good milk out of poor material. But my previous remarks on this subject will suffice. Still good materials may be spoiled by mixture with those which are deleterious. Although a mother may have supplied her blood with the best materials for the growth of the body in general, and the teeth particular, yet she may partake in condiments, relishes and drinks which will disagree with the stomach of her child, and render it unable to digest the food she offers it. Even if digested and taken into the circulation by the infant they often cause an irritation in the histological tissues which result in disease. Onions and other food of that character cause vomiting of the child. Pickles and other acids cause griping pains and diarrhœa. Coffee produces vomiting, bilious colic, and great irritability of the nervous system. Tea and coffee cause great wakefulness. Under excitement of the mind and passions have often killed infants as certainly as strychnine. Over-work, and heating the blood higher than normal, are very injurious to the health of the child. Medicines also partaken of by the mother, are very likely to produce pathological effects on the nursing child. Surely there is nothing strange in the fact that so many die in infancy, when the laws of nature are so constantly violated and the little innocent placed in such inharmonious relations to physiological laws.

If a mother cannot furnish *pure* and nutritious food for her child, a wet nurse should be had if possible, who can do so, and not without.

Whatever best promotes the *general health* of the child will accord with the best health of its teeth. Therefore, dress, bathing, exercise, fresh air and the sun's rays must all be considered and appropriately applied for its benefit. A lengthened discussion of these topics in this paper would be inappropriate.

The first teeth seldom erupt irregularly, or rather they present to the eye when all *are* erupted that beauty and regularity which is so delightful to the mother, and the earnest physiologist.

There are tardy eruptions and premature eruptions of the first teeth. In extreme cases both conditions are symptomatic of an impaired constitution, or previous arrest of development under influences which prevented nutrition. For it is generally the case that teeth erupted at birth or soon after, will be found devoid of roots in normal length. Such facts should lead the medical or dental attendant to enquire into the present and past hygienic habits of the mother, and correct them if necessary. Placing mother and child in the best physiological conditions, by whatever means are necessary, will be the best guarantee that nature will carry out her intentions in the perfect eruptions of the child's denture.

It is never too early to begin the practice of cleansing the infant's teeth. Water is very grateful to most children when cutting the teeth, and the teeth should be bathed and cleansed with pure water after the act of suckling.

If it is said that this is unnecessary, and that animals and many mothers also, never do this, and still the teeth of their offspring are sound, I merely reply, that while the habits of mothers are artificial, and their present constitutions the result of artificial habits also, we must use artificial means to restore or promote the health of themselves and their offspring. Thousands of children loose their incisors before

they are three years old by decay. This shows imperfect dentification and calcification of the teeth, but who can say that cleanliness of these organs during the period of lactation would not have prevented their chemical erosion by the acids formed by the putrefaction of the milk adhering to them, and the abnormally acid epithelial and glandular secretions.

The mothers milk has in many instances, a tendency to rapidly sour and disorganize, causing not only gastric and other constitutional derangements in the child, but also local lesions in the mouth.

The time of weaning a child must depend on the health of the mother and child. About the fifteenth month is perhaps the best, although it is better to vary the length of suckling so as to have the weaning in cool weather. In fact it is better that suckling should continue through the *second summer* if possible. The health of the child is thereby more fully secured, as gastric derangements are apt to ensue if the child is dependent on other food than mother's milk the second summer. For at this time it has not erupted the molars, and mastication is yet imperfectly performed at the very time when it should be thoroughly done if done at all.

Before weaning time has arrived the milk of the cow should be used in addition to that of the mother to some extent. Lean meats finely cut, and broths of meat may also be used advantageously, if judiciously employed. Very little vegetable food should be used before the child has cut its grinders. Starchy substances, such as corn starch, and fine flour bread, arrow root, &c., ought not to be used as food for the infant. Even if tolerated by the organism it is not natural, and foundations will be laid for gastric disorders which will more than likely take place in a year or two later under such a regime. Wheat finely ground but unbolted and divested of the course bran, if moderately used before weaning, at the latter part of lactation, will give the child the best pabulum for blood formations and lay the foundations for vigorous digestive organs.

A sudden transition from the mother's milk alone to other food is very likely to be disastrous in proportion to its departure from the proximate elements of the material milk.

Children should be taught to thoroughly masticate their food. The eruptions of the grinders may serve as a hint for food which *requires* mastication to make it comfortable to swallow. The teeth absolutely require exercise for their best health, and food should not be given to children at this age that does not require it. One very obvious reason for the perfect teeth of savages and semi-barbarous people is found in the fact that everything they eat requires mastication to make it even comfortabale to swallow, leaving out the heightened pleasure experienced by thorough comminution of food and its mixture with saliva. Mastication gives strength and vigor to the roots and delicate membrane investing them, and cleanses the teeth by attrition. The gums are also benefitted, and by continuity of tissue the other parts of the mouth and fauces.

By the end of the third year all the milk teeth are erupted, in good *position* generally. They ought also to be free from decay if decent hygienic measures have been heretofore in operation. The child is now old enough to use a soft tooth brush and should be taught to use it after every meal and lunch. They may very properly be allowed to eat five times a day, but not oftener. A child who is always eating will be sure to have dirty teeth, which will soon result in erosions and decay, besides a sour and weak stomach.

Sweets ought not to be forbidden in moderate quantity. There is a natural craving in infants for saccharrine substances; and there is no good physiological reason why they should not be allowed temperately. It is much better, however to give a child white lump sugar than candies which often contain noxious ingredients. Sugar as sugar never injures the teeth; it is only when converted into acid that it acts injuriously. Neither will ripe fruit containing

considerable acid injure the child's teeth when moderation is used in their employment.

The teeth of the child from their first eruptions ought to be under professional supervision, but at any rate it ought not to be deferred later than the third year.

At this point I will leave the subject, for I see before me a vast field for thought, which I must not now enter, as it would lead me far beyond the limits of your patience, namely, the preservation of the milk teeth until replaced by the permanent ones, and the care of the permanent teeth during the process of replacement.—*Missouri Den. Journal.*

ARTICLE V.

The Growth and Reproduction of Bone.

BY VAN S. LINDSLEY, M. D.

Professor of Physiology in the University of Nashville.

* * * * Having now examined the structure of bone, its growth and formation, we come, so far as regards the surgeon, to the practical application of our knowledge to the reproduction of bone in case of injuries.

We omit giving a detailed history of the various stages of a case of fracture, or resection, from the time of injury to the final restoration of the part to its normal condition, and will confine ourselves especially to the exact manner in which union takes place in fractured bone.

It will be admitted by all, that, when a bone is fractured, there is an effusion of some sort, which we call neoplasm, and that it comes from the surrounding structures.

What is the origin of this neoplasm, or new formation? Is it derived from the extremities of the bone itself, from the periosteum, the muscular and connective tissue? Or is the effused blood transformed into new bone, according to the old idea? Must cartilage precede the formation of bone, or may ossification occur without the intervention of cartilage?

Throwing aside all theories as to the best possible manner in which it *might* take place, let us lift the veil, so far as practicable, and actually watch with our eyes the plastic hand of nature as she prepares to weld together the dissevered bone, and make it whole and sound as the other.

Investigations prove that the new formation around a fracture occurs in the medullary and Haversian canals, in the periosteum and adjacent muscular and tendinous tissue. A large extravasion is disturbing here, as in the healing of wounds of the soft parts, for part of it must be absorbed, and the remainder organized. Among other ingredients in the effused material are small round cells, which rapidily increase, and afterward constitute the greater part of its bulk. According to the observations of Cohnheim, these cells are not newly formed, but are white blood corpuscles escaped from ruptured vessels.

It is difficult to understand the changes that now take place in the Haversian canals, subsequent to the effusion, without specimens of bone showing the changes, or faithful diagrams to illustrate them.

It must be remembered that blood-vessels occupy the Haversian canals, and that these vessels are connected to the walls of the bony canals by means of delicate areo tissue. Now what we observe is this—the cell formation exudes between the coats of the vessels and thebony wall of the canal, and forming gradually, the effect is to create pressure upon the bone partitions between the Haversian canals, and cause their absorption. If, at this stage, we macerate a bone thoroughly, so as to remove all the soft structures and vessels, it presents a corroded, roughened appearance, is more porous, and weighs less than normal bone.

Investigators, Bilroth of Vienna among them, have found difficulty in explaining why the bone, under these circumstances, is absorbed, and by what agency it takes place. "At present it is not known," says Bilroth, "how the lime salts are dissolved in this process. I think probably the new formation in the bone develops lastic acid, which

changes the carbonate and phosphate of lime into soluble lactate of lime, and that this is taken up and removed by the vessels. It would also be possible for the organic bases of the bone, the so-called osseous cartilage, to be first dissolved by the inflammatory neoplasia, and then there would be a breaking down of the chalky substance, whose molecules would subsequently be removed, even if undissolved."

As the chemist and physiologist can give us no clue as to the how and why in this case, and can suggest no mode of experimenting, by which the mystery may be solved, we must, for the present, attribute it to that vital force, acting behind cell-agency, which we everywhere see in the living body, but cannot explain. Through this cell-agency, with the presence of bone to determine, by a kind of catalysis, what shall be the final result, we have the two principal factors with which to work out the problem.

This is the only instance in the body, so far as I know, in which the new formation partakes of the same grade of structure as that which was destroyed. When muscle or skin is divided, reunion takes place by means of connective tissue—a lower grade of structure. But when bone is divided, reunion is affected by the reproduction of bone itself.

Were it otherwise—did reparation of bone take place by means of cartilage, tendinous, or fibrous tissue, we would *always* have pseudarthrosis after every fracture, instead of occasionally, and the poor unfortunate individual with a broken thigh would be the most pitiable object of helplessness that could greet our sight.

Let us return to the changes going on in the Haversian canals, and the now solidifying external and internal callus. Here we find the vessels of the canals extending across from one fractured extremity to the other, and also permeating the new formation in the medullary canal, and on the surface of the bone. Now from all we gather from recent investigations, the new ossific matter is deposited around the vessels in the enlarged Haversian canals of the old bone, and takes the place of the effused cell; the Haverian canals

become less and less by osseous deposit upon their walls, until they are reduced to their normal size.

In some of the smaller animals, and in the bones of young persons, the callus first become cartilaginous, and is then ossified ; but in adults ossification commences directly, without formation of cartilage.

We became convinced, some time since, that undue importance had been attributed to the periosteum by Jourdan of Manchester, and others, in the reparation of bone.

The periosteum, so far as we are able to determine, contributes its mite of assistance when present, upon the principle that the more intact the parts, the easier and quicker will be the reparation of the injury, but nothing more: there is no peculiar osteoplastic properties inherent in it, by which it takes precedence of the other tissues, presides over, and determines the process of bone-making.

In fracture, the old periosteum is involved in the mass of the external callus, and a new membrane, which afterwards becomes periosteum, is formed on the external surface. And at points of bone where tendons and ligaments are inserted, and there can be no periosteum, fractures unite and heal as firmly as elsewhere. The periosteum holds the same relation to the bone that the pia-mater does to the brain. Its chief use is evidently to support the vessels going to the bone, and afford them a bed in which they may subdivide into fine branches, and enter the dense tissue at numerous points.—*Nashville Jour. of Med. & Surg.*

EDITORIAL, ETC.

The Baltimore College of Dental Surgery.—The thirty-fourth annual session of this, the oldest dental college in the world, will commence on the 15th of the present month, (October,) and continue until March, 1874.

The prospect for a class even larger than that of last session, is most encouraging; and an increased number of European students have already matriculated for the coming session.

During the past two months considerable improvements have been made in the college building, which, with those contemplated at an early day, will render it one of the most complete structures of the kind in the country. The infirmary and laboratory, each extending over the entire building, cannot be excelled for room, light and comfort. Every exertion will be made to maintain the high standard of this time honored institution.

American Academy of Dental Science.—The sixth annual meeting of this Academy was held in Boston, on Monday, September 29th. The annual address was delivered by Prof. P. H. Austen, M. D., D. D. S., of the Baltimore College of Dental Surgery, at 2 P, M.; and essays were read by Drs. N. W. Kingsley, of N. Y., Asa Hill, of Connecticut, and I. T. Codman, of Mass. The annual dinner was served at the Parker House, at 5 P. M.

Treatment of Teeth with Dead Pulps.—Dr. I. N. Krouse, of Chicago, " thinks it much better to treat this class of teeth too often than not often enough. If they were always treated properly before filling, we should not have so many alveolar abscesses. Uses creasote a number of times, getting to the end of each root if possible, so that every particle of decomposing matter, and the

gases arising therefrom, are destroyed. Dr. Glidden's drills are superior to any we have in the depots, which may account, in part, for his success in filling dead and abscessed teeth without previous treatment. Yet the speaker could not agree with this practice. As before said, we must have all decomposition stopped and the root in a healthy condition, before filling, and in case of alveolar abscess, the sack and growth at the end of root must be destroyed. Knows of nothing better to accomplish this than creasote. His plan of getting this through the fistulæ is with India rubber. Makes a piston of it by cutting it something of the shape of the carious cavity, then fills the root with creasote and pumps with the rubber piston, making quick and rapid motions, using some blunt instrument that will not pierce the rubber. Often succeeds in getting the creasote through without enlarging the pulp-canal, but when we cannot succeed without drilling and enlarging the canal, this should be done. He makes a drill for these special cases, filing it very small, so that it is limber a considerable way, then makes a good spring temper, and it works admirably. He much prefers, however, not to drill through and enlarge the opening at apex, and never does it unless he cannot succeed in forcing the creasote through the fistulæ. Would then close the tooth with temporary filling, if it was likely to be stubborn about getting well, before filling permanently.

Dissolved Hill's stopping is very good to fill certain cases, as where the root is crooked and when impossible to fill with gold with any certainty; but in most cases fills with gold after plan suggested by Dr. M. S. Dean—with No. 20 or 30 foil. Thinks in this way roots can be filled, in a majority of cases, better than with any other substance. Next to this, perhaps, comes gutta percha, or Hill's stopping dissolved in chloroform. It has the advantage of not requiring so much skill or care in its manipulation. The treatment of the case spoken of by Dr. DeCrow, could not be very definitely determined here without an extensive description. We must have all the circumstantial as well as the direct evidence. The former habits of the patient should be known. Some constitutional difficulty, perhaps syphilis, is at the bottom of the trouble. It has been recommended to extract and replace the tooth. If every other known remedy has failed,

and there is no prospect of nature setting up a healthy action, then it may be allowable to extract the tooth. The practice of extracting and replacing teeth should be the very last resort and only practiced as such. Within the last few years we have been hearing considerable about this plan of treating alveolar abscesses. Had but little faith in it himself. Cares not what is done with the tooth after it is extracted, whether it is scraped, or the ends of roots cut off, soaked in carbolic acid, or kept in tepid water, till the periosteum is restored or made healthy. To make it a general practice is not rational, and does not belong to the nineteenth century."

Replantation of Teeth.—During the discussion of the subject of Alveolar Abscess at the late meeting of the Illinois State Dental Society, Dr. Chase, of Mo., remarked that these cases of replantation are more numerous than we should have supposed.

He said: "We know that teeth have been knocked out and lain in the dirt for two or three days, and after replacement have grown firm, and after recent luxation the circulation has become re-established.

In case of persistent alveolar abscess, he thought every one justified in conquering it by extraction and replantation.

It is astonishing what a tooth will bear. The idea that the periosteum is destroyed by cutting off the apex of the root is all a mistake. It is not at all necessary to keep the tooth in tepid water or blood. Time may be taken for the operation. In some cases it may be well, previous to operation, to take an impression for making a plastic retaining cap or splint upon, to be used after replacement of the tooth. He should treat the next case of a persistent nature that came under his care in this manner.

When there is no external opening in alveolar abscesses, forces creasote up; it causes great pain.

Remembered a case, of two teeth treated in the same mouth, though not at the same time. One had an external opening, the other not. In the case without opening there was more pain than in the other, but it succeeded in a shorter time than the one that had the opening.

In a communication in a recent number of the *London Dental*

Review, the author advocates pepsine for dissolving dead portions of pulp. This struck the speaker favorably, and accordingly he had tried it for several months. It accomplished its work within a few hours, provided the pulp has not previously been treated with creasote or tannin "

Dr. Kilbourne, of Aurora, Ill., related a case of extraction of a first bicuspid, for incipient ulceration, and replantation. After cleaning root-canals with creasote, and filling with gutta percha, and filling carious cavity with tin, the tootl was replaced and left without ligation, and has been doing well since—about two years ago.

OBITUARY.

Dr. Amos Westcott.—At a meeting of the Dentists of Syracuse, N. Y. relative to the loss the dental profession has sustained in the sudden demise of Dr. Westcott, the following preamble and resolutions were unanimously adopted; [Dr. Jas. Chandler, Chairman, and Dr. F. D. Nellis, Secretary of the meeting:]

" *Whereas*, a mysterious Providence has removed from our midst Amos Westcott, M. D., D. D. S., one of the oldest dentists of this city; therefore,

Resolved, That in the death of Dr. Westcott, the profession of dentistry has lost one of its foremost members,—one who has done as much as any member of the profession to promote its advancement and growth,—who, both as a writer and teacher, instilled into the minds of students the most valuable principles of our practice, the beneficial effects of which are as extensive as civilization itself, and whose name is honored by dentists throughout the world.

Resolved, That while we testify to the pre-eminence enjoyed by the deceased in the dental profession, we bear witness with equal emphasis to his worth and uprightness as a man. Genial in manner, he always stood ready to assist, by his counsel, those who were struggling upwards, taking a deep interest in the welfare of his fellow-men, and especially of the city of his adoption.

Resolved, That we deeply sympathize with the afflicted family in their sad bereavement.

Resolved, That, as a further mark of respect, we, the dentists of Syracuse, attend the funeral of the deceased in a body.

Resolved, That a copy of these resolutions be transmitted to the family of the deceased, and that the same be published in the daily papers of this city and in the leading dental journals of the country."

Dr. Westcott was for a number of years connected with the Faculty of the Baltimore College of Dental Surgery, being Professor of Theory and Practice of Dental Surgery from 1846 to 1850, previous to which he was Demonstrator of Operative Dentistry, having received the diploma of this institution in 1843.

Dr. Westcott, after his return to Syracuse, was elected to the responsible position of mayor of the city, and was regarded as one of the leading dental practitioners in the State of New York.

JOSEPH ROBINSON, D. D. S.—It is with regret that we announce the death of Dr. Joseph Robinson, a graduate of the Baltimore College of Dental Surgery, of the Class of 1865, which occurred near Black Horse, Maryland, August 31st, 1873.

Dr. Robinson practiced dentistry in Baltimore from the time he graduated until a few months prior to his death, when failing health compelled him to leave the city for his country home. Dr. Robinson was of a modest and retiring disposition, and was noted for his upright, gentlemanly conduct.

His desire appeared to be to practice his profession in such a manner that no act of his should in any way detract from its respectability and usefulness; and his mind was imbued with correct ideas in regard to professional courtesy and justice.

The Process of Taking Cold.—Daily experience teaches the medical practitioner that persons who guard most anxiously against every possible chance of taking cold are most frequently its victims. Geiger, in an article on the mortality of children at Würtzburg, Germany, translated by Ch. Rauschenberg, M.D., Atlanta, Ga., shows that diseases of the respiratory organs cause, in the first year of life, the death of relatively many more legitimate than illegitimate children; while the contrary is true of diseases of nutrition, proving that the too great care of fond mothers to their offspring frequently produces what it is intended to prevent.—*Med. Record.*

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ARTICLE I.

Pivot Teeth.

BY DR. E. D. SWAIN.

The painless extraction of teeth, together with the easy and cheap methods now in vogue of inserting artificial denture upon plates, have the tendency largely to throw the attachment of artificial crowns to natural roots, by means of pivots, into disuse; though, under favorable circumstances, this is admitted to be one of the best modes that can be adopted. If the roots on which they are placed be sound and healthy, or if not healthy, made so, and the back teeth be reasonably good—that too much strain may not be thrown upon the pivoted tooth—these will subserve the purpose of the natural organs more perfectly than any other description of dental substitutes, and can be made to present an appearance so natural as to escape detection upon the closest scrutiny, as well as to render valuable service for many years. In short, their advantages may be summed up as follows: A better preservation of the contour of the parts surrounding; nearer approximation to nature; greater firmness, and therefore more serviceable, and greater economy for the wearer; besides giving to the operator, when

successful, a sense of having done that which is best for his patient as well as himself.

Prof. Austen, in the chapter upon this subject in Harris' "Principles and Practice," informs us that only the six anterior superior teeth should ever be pivoted, and questions the propriety of pivoting to the roots of lateral incisors unless of very good size; further he tells us that in no case should a lower incisor be placed upon a pivot, because of the great danger of ulceration, and their small size. Both these objections I consider to be without a good and reasonable foundation. Fortunately we are very seldom called upon to replace single teeth of the latter class; and my experience has been that ulceration, when in that condition, is as easily managed as in other single straight rooted teeth. If called upon, however, to insert an inferior incisor where the root was intact, I should consider the pivot superior in every sense to any other known method. Bicuspids (especially the superior) may be, and often are, successfully set in this manner.

One of the strongest arguments in favor of pivot teeth is the *retention* of the root, and thereby preventing absorption of the alveoli about the necks of adjoining teeth; the removing of one tooth or root is taking the keystone from the arch.

The result, we all know, in time, is the gradual elongation of the tooth, or apsorbtion of the socket of adjoining teeth, exposing the root and weakening their support, and even sometimes, when an artificial tooth has been constantly worn on a plate, the adjoining teeth incline toward each other, and thus disfigure an otherwise comely set of teeth.

In the days past, when the nutrition of the teeth was not so well understood as at present, when it was believed that a pulpless tooth was dead, and would, like any other foreign substance, be thrown out, men were perhaps excusable for extracting such teeth under all circûmstances; but with our better knowledge, our duty is to preserve, and thereby keep together, the different parts of the human machine as long

as possible. That a so-called devitalized tooth is not entirely dead, we all know; that they do die, however, is equally true; and when death has ensued, no amount of treatment will induce their retention, but, like other foreign substances and dead tissue, it will be disposed of by the processes by which nature accomplishes such work. A crownless root I consider far more apt to become diseased and die than one not deprived of that very essential portion, because, with the crown, it has lost that essential stimulant to good health, viz: exercise, and consequent irritation, inducing better circulation of the blood about it, and therefore better nutrition.

There are to-day few intelligent and conscientious practitioners in our profession who would extract an ulcerated superior incisor with crown complete, half, or even a larger portion, gone; but they would, by proper treatment, heal the same, fill the root and restore the crown to its normal shape with gold, sometimes even to disfigurement. I am sorry to believe, however, that many of these same practitioners would extract, did there not exist the opportunity to display an advertisement in the shape of a contour filling. It cannot be that the half crown restored with gold to its normal form in any manner assists in maintaining the healthy condition of the root, otherwise than as has been mentioned, by giving the necessary exercise, and thereby better circulation and nutrition.

If a root can be made healthy and capable of supporting a natural, dead crown, and fifty per cent. of this foreign material, why may it not support an artificial crown equally as well? I say dead crown, because I understand it to be admitted that the enamel and dentine of a devitalized tooth are dead, and that the tooth is only retained through the life of the cementum, in which the vitality is of so low an order that it tolerates the dead dentine within. This is certainly a very fortunate condition of things for those who advocate contour fillings in devitalized teeth, or the setting of pivot teeth upon such roots.

The first step to be considered is, of course, the preparation of the root for the reception of the artificial crown. If it be in a diseased condition, it must first be made healthy. My practice is, first, after removing a sufficient quantity of the remaining crown, to give free access, to enlarge the pulp canal, and, if there be no indications of active disease, use such remedies as will thoroughly disinfect the same; then pack with cotton loaded with the saturated solution of iodine in creasote, and seal tight. If no soreness arises after two or three days, I then feel safe in filling that portion of the canal above the hole which is to receive the pivot, either with gold, cotton dipped in liquid gutta percha, or Hill's stopping. I prefer the latter because of its indestructibility, and because it can be easily and thoroughly introduced, and if trouble arise it may be easily removed for further treatment. If an ulcer exist, disinfect as in the first case, and leave the root open or filled lightly with cotton for a day or two; then inject the solution of iodine and creasote through the foramen and fistula, if there be one. Unless it be a very obstinate case, one dressing of this character will suffice, leaving for a few days with a simple light cotton stopping, and as soon as the fistulous opening is healed, proceed, as before mentioned, to fill permanently.

The preparation of that portion of the root which is to receive the pivot may depend entirely upon the condition of the root and the kind of crown to be attached, and possibly upon the length of the patient's purse, for "the poor ye have always with you," and they cannot be turned away. It may be carefully and thoroughly filled, covering every portion of dentine, around a gold tube, which is to contain the pivot; or it may be simply drilled sufficiently large for the reception of the pivot, be it of either wood or metal. I have, when badly decayed, prepared as for a gold filling, and filled with amalgam, using for the tube platina instead of gold, because convinced that there is less galvanic action between the alloy and this metal, than exists between the alloy and gold. About three years ago I inserted two

central incisors for a patient in this manner, which are at the present writing every way satisfactory to myself as well as to the patient.

The use of Wood's fusible metal as a root filling is dangerous as well as otherwise unsatisfactory—dangerous because the heat necessary to be applied is often sufficient to cause death to surrounding tissues, and consequent eventual loss of root—os-artificial and Guilois' cement are not sufficiently reliable as to their permanency, being in a large majority of mouths dissolved by the oral secretions. If the first method be decided upon, viz: the tubing and filling of the root, I proceed first to the manufacture of the tubing or hollow wire; selecting a piece of iron, or, what is better, steel wire the same size as the gold wire to be used for pivot, around which bend a piece of eighteen carat gold plate, fitting as closley as is possible with mallet or hammer; then reduce to the proper size and thickness by drawing the whole through a wire draw-plate. Having reached the desired size, remove the wire, and solder the joint to give stiffness in future use; then, with a screw-plate, cut a thread about as far as will be necessary for the case in hand—from one-half to three-eighths of an inch; then drill the root just large enough to admit the tube being firmly screwed into it, without using sufficient force to twist it. It is unnecessary to tap out this hole, as the thread upon the tube makes sufficient thread for itself, and holds firmer than when the tap is used.

These preparatory steps do not necessitate the filing away of the crown to the margin of the gums. In fact, it is the best not to do so until the rubber dam is adjusted, which may be carried sufficiently high to be out of the way, and secured by two small gold screws as nearly upon the mesial and distal surfaces as it is convenient to drill, tying above them a well waxed cord of silk; this will in nearly all cases retain the dam securely. This accomplished, that portion of the crown necessary to be removed may be filed away, or, what is better, cut away with proper shaped burs with any

of the burring machines in use. Then, if the root be a sound one, cut a cone-shaped cavity in its end, with undercuts deep enough, which, with the thread upon the tube, will retain the filling firmly. If decayed, of course remove all disorganized tooth substance, as in any other case when preparing for a filling. Now screw the tube into place, leaving within it a piece of the wire over which it is made, to prevent injury to its inner surface, and proceed to fill. The filling should in all cases cover every portion of the root's end, and also be built down sufficiently far to leave, when filed off, a cap or plate of the necessary thickness for a solid foundation, and stiffness enough to remain in place. If the crown be already broken, or decayed away to the margin of the gum, a ferrule of gold or platina may be fitted around the end of the root, secured with gutta percha or *os artificial*, and the dam put on over this; or in comparatively dry mouths, if the parts be wiped dry and painted with the liquid gutta percha or collodion, thus effectually preventing the secretions from these parts giving trouble; using napkins, as in general filling, to control the flow of saliva.

These details will apply to the preparation of all roots where tubing is resorted to. If the filling be of amalgam, the rubber dam may be dispensed with. Complete dryness is, however, quite as essential for a perfect amalgam as for gold fillings.

The root prepared by any of the above or other methods, we next turn our attention to the crown to be attached and kind of pivot to be used.

Prof. Austen, after canvassing all the known materials used for pivots, concludes that wood is superior to all others, for the following reasons: First, that it holds the crown firmer; and secondly, because it does not, like metal, wear away the root. That when first introduced it does retain the crown very firmly, is true—no more so, however, than metal may be made to do. The second conclusion in its favor, or objection to metal, is not of sufficient importance to be considered. Any material firmly held in place will

not wear the roots, or tube, sufficiently to be observed in at least one generation, and in these cases we do not work for anything beyond our own day and age. When by chance the holes in root and crown to be set are opposite, and the pivot straight, and the patient does not object to the odor always arising from a tooth set in this manner, wood answers a very good purpose for a limited number of years.

We all understand that constant dryness is one of the essentials in preventing decay of tooth substance. A wood pivot necessarily gives us constant moisture; in fact, it depends upon this property of absorbing moisture, in a great measure, for its firmness. Saturated with pure water even, it would hasten decay; but when saturated with such fluids as it must be in the mouth, what must be the result? Therefore, when permanence is to be one of the considerations, we must discard wood, and select a material less destructible. For reasons embodied above, in my own practice I have adopted the metal pivot, and will feebly endeavor to point out some of the ways in which it may be used.

If it be desirable to use the crown known as the pivot tooth, either a platina or stiff gold wire may be inserted into it by dipping the end of the wire into pulverized borax, inserting into the hole and flowing solder about it. No trouble will be experienced in accomplishing this, if it be remembered to keep the highest heat upon the tooth. The solder will fill the space about the wire, fitting into all the irregularities of the hole and holding very firmly. When the holes in root and crown are opposite, like the pivot of wood, this answers a very good purpose; and even when an obtuse angle is necessary in the pivot, it can be much easier fitted and be made stronger than the wood pivot. The attaching of a pivot of metal to the plain tooth requires more labor, but in my opinion, its superiority in all respects more than compensates for this. It is easily adjusted to conform to the other teeth, be the root before or behind the arch, whether the hole, owing to the direction of the root, be straight or at an angle, as well as possessing greater strength.

It is usual, first, to secure an impression of the end of the root and adjoining teeth, to make metal dies, and swedge a piece of plate to cover the end of the root; this to be punctured at the point covering the hole prepared for the pivot, and, when fitted, soldered to the pivot. Upon this plate the tooth is to be set, the two pieces cemented together with shellac and adjusted to the mouth, removed and soldered. If to be so made as to be removed at the will of the patient, the pivot must be made of two halves of half round spring wire, or split with a fine saw before inserting, the two parts being sufficiently separated to form a spring, which will retain the tooth in place. If to be securely fixed, the hole should be a little larger than the pivot, and the pivot should be coated with Hill's stopping or gutta percha, the root wiped dry, the pivot and coating warmed and forced home, and so held until the whole becomes cold; then trim away the surplus materials. This not only holds the pivot firmly, but fills the space between the plate and root, thus protecting the latter. Gutta percha I think preferable because it adheres closer to the root and pivot. During the past three years I have set many teeth in this manner: Preparing the root as for a wood pivot, take an impression, and upon the plaster cast burnish a plate of pure gold or platina, fix the pivot, and try it in the root. If the plate does not fit accurately, it may be fitted either with a burnisher or by mallet force, with a large pointed plugger; then attaching the tooth as above related, and the whole secured in its place with gutta percha.

I have seen roots upon which teeth set in this manner, after several years wearing, showed no signs of decay. This method saves time, and, therefore, money to the patient, when such an end is desirable, and gives a very substantial and satisfactory result.

Another very good suggestion upon this subject is given in the March No. of the *Cosmos*, 1873, which I cannot describe better than in the writer's own words:

"Instead of adapting a crown with a fixed pin of either wood or metal to a root, insert a metal pin in the root, make

a filling of gold on the end of the root, and adapt the crown to that. There will only be exposed what appears to be a small filling along the margin of the gum. Our method is to insert an eighteen carat pin into the root, by means of threads cut on that part of the wire to be inserted, having the other end cleft with a fine saw, and protruding sufficiently to occupy the hole in the artificial crown. The wire having been firmly screwed into the root, and a proper crown selected and adjusted, enter two or three of Dr. Mack's small retaining screws, cut pieces from the heaviest gold, say No. 480, a little larger than the end of the root, with holes punched to correspond with the screws inserted in the root, lay on one after another, condensing with smooth faced instruments, occasionally paying special attention to condensing small pieces arouud the pins, maintaining the convexity of the root; then set the crown, and file and burnish down the protruding gold about the edges of the roots."

With this method, I do not understand it to be the intention of the writer to file the root below the margin of the gum. The capping of the end of the roots is made easy by the help of the rubber dam. This is, so far as the preparation of the root, somewhat similar to Dr. Mack's method; but for a crown he provides a patent tooth, with a slot for the reception of two or more screws, secured in the root, the slot to be filled with Wood's fusible metal, Guilois' cement, or other plastic material. This method fails, owing to the destructible nature of the materials used in uniting the crown to the root.

I have with me a couple of these patent teeth, that any who desire may examine. In the November No. 1872, *Cosmos*, there appears an article headed "Artistic Dentistry," by Dr. H. M. Webb, of Lancaster, Penn., in which he gives a description of what he terms grafting, which is, in fact, the restoration of the crown with gold, but faced with porcelain. It involves the same principles as the plans above given, viz: the protection and prevention of further decay of the root, and though by no means entirely new, is truly

artistic and enduring. Such work was recommended several years since, by Dr. Dwinell, and I know of at least one bicuspid root thus provided with a crown some four or five years since, by a practitioner in Chicago, in the mouth of one now present. Although operations such as these are tedious to operator and to patient, as well as necessarily expensive, they possess advantages, and one is that a tooth when fractured obliquely and devitalized, it may be desirable to save that portion of the crown remaining, and as objections are urged against the exposure of so much gold, the porcelain face may be attached, firmly secured and backed up with cohesive gold, showing only a fine line of gold at the point of union. As the treatment of diseased teeth by extraction and replanting is at the present time being somewhat agitated, and has in many cases proved successful, I will relate two cases of extraction of roots with pivoted crowns, and then returned to the sockets, with results.

Dr. Meredith, of Cincinnati, publishes his experiences something as follows:

A patient called, desiring a pivot tooth set upon a root much diseased, and very loose, advised extraction, which was not consented to. A pivot tooth only would satisfy the patient. After much persuasion, and some compunctions of conscience, the doctor consented, proceeding to business, and succeeded to his satisfaction in the selection and setting of the substitute, except finding it somewhat too long, and in the attempt to remove it, for the purpose of shortening, extracted root and all. Fearing a brisk breeze if the patient discovered the mishap, he placed over the other teeth, and place where root had been, a napkin, requesting that it be retained there until his return, retired to the laboratory, shortened the tooth, cleaned the root properly, and returning, forced the root again into the socket, dismissing the patient. After a reasonable amount of soreness, this root became healthy, and does service at present.

Dr. Brophy, a practitioner of Chicago, related to me a case in practice, involving the same principles. He, how-

ever, extracted purposely a root, upon which an artificial crown had been some time worn, treated as is recommended for ulcerated teeth, and replanted. This also became a healthy organ, and bids fair to do good service for a number of years.

These cases I mention simply to show that treatment which is admissible for diseased roots bearing natural crowns may successfully be resorted to with roots bearing artificial crowns, whenever it would seem necessary or desirable to attempt to save them. The cases when such practice would seem to be necessary may be few and far between, still when they do present themselves, the experience of the gentlemen above mentioned may be of great value.

ARTICLE II.

May the Calcific Elements of the Deciduous Teeth be Appropriated in the Formation of any Portion of the Permanent Ones?

BY M. S. DEAN, D. D. S., CHICAGO.

Read before the Illinois State Dental Society.

I propose to show that the lime salts of the deciduous teeth may be (are) used again in the formation of parts of the permanent ones, or in the growth of tissues requiring these materials I do not claim to be able to prove this by original researches in chemistry or physiology, but only by natural conclusions from well-established physiological facts.

If we take a comprehensive survey of the general features of this subject, simply in the light of common sense, we shall admire the exquisite skill with which the human body is framed. In it we shall find beauty, strength and compactness harmoniously blended; we shall be struck with amazement at the *economy* which manifests itself, everywhere, in the construction and maintenance of each individual part. In the formation of the osseous system, for instance, we shall see lightness combined with inflexibility and strength;

and wherever it becomes necessary to use the bones for fulcrums or as attachments for the muscles, their bulk is increased, while their weight and strength still retain their just proportion to the other parts. In short, they are composed of materials so arranged that the least possible quantity of matter will yield the greatest amount of durability and strength.

Then, again, we shall observe that the *supply* of materials that is furnished for the growth and repair of the organs is used with scrupulous economy. No portion is lost or allowed to go to waste. To guard against this waste of material, the system is traversed by a host of little gleaners—the lymphatics—which gather up from the interstitial parts all the strayed exudations, and carry them into the general circulation; so that nothing which can be assimilated or appropriated by any organ or tissue is permitted to go to waste, or escape from the system as excreted substance, unless there be an excess of these ingredients in the system.

So marvelous do we find the plan of economy, upon which the complex machinery of the various functions of our bodies is carried on, that a cursory examination even of its details must convince the most skeptical that "The hand that made us is divine," and that this divine hand is shown most conspicuously in the ECONOMY of the *forces* and the *materials* employed in the construction and maintenance of the human body.

Now, as a familiar example illustrative of the *economy* with which the system may use the *inorganic* materials introduced in the food, the management and disposition of common salt affords an excellent one. And upon this point I cannot do better than quote the words of Draper, who, I believe, expresses the opinion of physiologists generally upon this subject. He says,: "Oxyde of sodium, or soda, is a uniform ingredient of the bile. The hydrochloric acid of the gastric juice, and soda of the bile, are derived from the same source—common salt—which is either present in the food or purposely added as a condiment. It undergoes de-

composition easily, yielding the two products specified, that is, hydrochloric acid and soda, and is readily formed by the union of these two substances. Common salt introduced into the system undergoes decomposition, furnishing hydrochloric acid to the gastric juice and soda to the bile. Considering the large quantity of these secretions produced in a short space of time, it is clear that the drain of common salt must be great—not less than a third of an ounce a day; yet the quantities consumed, at least, are only small. How, then, is this explained? Assuredly, there is no other source from which these bodies can come than the one indicated—the common salt—and yet it seems to be totally inadequate." He says further: "I think this difficulty is rather imaginary than real. Things are so arranged that a limited quantity of salt can produce unlimited quantities of gastric juice and bile; for the former, associated with the food it has digested, scarcely escapes from the pyloric valve before it encounters the bile and pancreatic juices discharging into the duodenum, and through the length of the upper portion of the small intestines these secretions, together with the food they have acted upon, are brought into complete contact. The reproduction of chloride of sodium is, therefore, constantly taking place in intestinal digestion, and it returns back into the system through the absorbents. Again, it undergoes decomposition, its acid reappearing in the gastric juice, and its alkali in the pancreatic juice and bile. By thus using a small amount over and over again, great effects can be produced, and it is then only necessary to restore those small portions that are wasted in carrying out the general scheme."

Here Draper has given a beautiful illustration of the wonderful economy with which the system may use the *inorganic materials.* Were all the elements introduced in the food incapable of further use after having served one purpose in the system, the body would be overloaded by the mass of materials it would have to carry, to such an extent, perhaps, as to nearly deprive the animal of locomotion.

This faculty—if I may use the expression—of using again and again the same identical ingredients—this power of successive decomposition and redecomposition of common salt in the system would seem to solve the mystery which I have been unable, until now, to account for, and that is the thrifty appearance which neat cattle maintain for many months after the external supply of this essential material in nutrition is cut off. Their internal supply is sufficient as long as it is retained in the system. And, on the other hand, the daily escape of a minute portion of this ingredient with the excrements would account also for the subsequent languid and unhealthy condition of these animals when deprived of a new supply for a greater length of time. Both of these facts have become notorious, that is, that cattle do not seem to suffer in health when deprived of salt for several months; but if this deprivation be continued for a long time, say six to twelve months, the appearance of these animals contrasts very unfavorably with other cattle which are fed the same kind and quantity of food, with the addition of salt.

From this general view of the *providence* and *economy* of nature, it is unlikely, *a priori*, that the rich supply of calcific matter taken from the deciduous teeth should be allowed to escape from the system as waste, especially when the same kind of materials is needed for growth or repair in many parts of the body.

Now let us for a moment examine the nature of the materials removed by the absorbents from the deciduous teeth, and see whether they are capable of being re-employed.

In the first place, they are living materials, in one sense at least, although Beale calls all " formed material" dead material. But I shall apply the term *living* material to the ingredients of teeth in which the pulp is not devitalized, to contradistinguish it from the constituents of teeth in which the pulp is dead.

These materials, in deciduous teeth, are not absorbed *on account* of their degeneration ; they are not taken away by

these vessels *because* they have become disintegrated, and thereby rendered less capable of performing their functions in the tissues or organs of which they are constituent parts, than they were *before* the absorbents seized upon them and dissolved their combinations. But these materials—these teeth—are taken out of the way, because they are a physical obstacle that must be removed, in order to give room for their stronger and more enduring successors.

The removal of these materials is the result of physiological or vital action, and is not a pathological or chemical process. If it were the latter (chemical action) the pulpless or dead teeth might also be removed by the same process. The dead teeth, though they yield as readily to the action of chemical agents as do the living ones, resist effectually and totally the absorbent forces of the papillæ. These materials, then, are living undegenerate matter, taken up by vital or physiological forces, and carried into the circulation, and there can be no reason whatever for supposing they have become unfit pabulum for other tissues. Some may contend that the lime salts taken from these teeth have lost their connection with the organic matter, with which they have been intimately associated, and for this reason cannot be appropriated by the tissues. They may take the ground that the phosphates have become disorganized, so to speak, and that these identical ingredients cannot be again assimilated until they have become re-organized, as it were, in the vegetable form, and in that form enter the system again. This objection to the use of the calcareous elements of the deciduous teeth is, I think, utterly groundless, even if they had lost their intimate union with organic matter; for it is altogether probable that the crude phosphates may form this connection with organic matter *within the system*. But if we grant that this combination cannot be effected internally, it by no means proves that these calcific elements cannot be appropriated by the tissues, for all the authorities I have noticed upon this point agree that the phosphates leave the body in the same form in which they enter it in the veg-

etable food. If this be the case, the objection to the re-appropriation of these materials, on account of the disintegration of the organic matrix, or their separation from organic matter in which they have been held, is without a shadow of foundation.

That this waste of the lime salts of the deciduous teeth would be contrary to the economy of nature, I think I have already shown; and that it is contrary to other analagous processes in nutrition, I think I shall be able to furnish sufficient evidence.

The opinion of physiologists generally, is by no means adverse to this view. Lionel S. Beale, says:—"In the formation of muscle, for instance, from lifeless nutrient pabulum in the blood, the matter which is to become muscle passes through these different conditions:

"1. That of soluble nutrient matter, or pabulum.

"2. Germinal matter, nucleus.

"3. Imperfectly developed, formed material.

"4. Fully developed, formed material, muscular contractile tissue.

"5. Disintegrated formed material, which becomes slowly reduced to a soluble state, and is converted, by oxydation into new substances, some of which pass away, while others in their turn become pabulum for other kinds of germinal matter, such as the white blood corpuscles and the lymph corpuscles."

Here Beale makes the direct statement that some of the disintegrated muscle tissue may be used again as pabulum for germinal matter. And as far as his authority goes—and I believe there is none greater—the question is already settled that materials which have been used in the formation of one tissue may be afterwards appropriated by others. Dunglinson, Carpenter, Dalton, Flint and Paget, as far as their testimony goes, it is indirectly confirmatory of this statement of Beale, though they are more reticent on this point than Draper, who iterates the same sentiment in these words:—"The constitution of the urine proves that the

amount of muscular fibrin destroyed in short periods of time is very great. We cannot estimate the hourly consumption at less than 62 grains. Such a waste must demand an equivalent compensation, if the animal mechanism is to be kept unimpaired, and every care is therefore taken to omit no means which may incidentally offer for husbanding the necessary materials. The action of the lymphatics illustrates this principal significantly. Passing through all the soft solids, where exudation of albumen from the blood-vessels can take place, they collect the materials that would otherwise go to waste, and add thereto many of the products arising from disintegration and decay of the soft parts themselves."

In regard to the development and maintenance of the adipose and osseous tissues, he says: "From the phenomena of nutrition generally, we may conclude that there are several sources from which *materials* for these purposes may be derived; a part may be obtained directly from the food; a part may be manufactured or fabricated in the system itself, or *may be taken from some locality therein*, in which it has become redundant or useless, and transferred elsewhere to the point at which it is required."

Again, he says:—"In the adult the sources of bone-earth are two-fold; in part it is derived from the food, and in part from the re-modeling and changes of the bones themselves."

The same author makes the following clinching statement, which, if possible, is still more to the point:—"As to the sources from which phosphate of lime are derived, though doubtless the food offers it in considerable quantity, there are many reasons for inferring that the identical portion which has been removed from one part, is used for the extension of another; and thus we may say that there is a plastic operation continually going forward, a re-modeling, so as to adapt the structure to its new conditions if in a growing animal, or to maintain it in good repair if in an adult."

These statements of Beale and Draper, if worthy of cre-

dence, are sufficient analogical evidence to satisfy me that the calcific elements of the deciduous teeth may be appropriated in building up portions of the permanent teeth, or any of the other tissues of the body that require calcareous elements.

So also Liebig—" It is obvious that the phosphoric acid which in consequence of the metamorphosis of tissues is produced in the form of soluble alkaline phosphates must re-enter the circulation of this class of animals (the graminivora.) It is then employed in forming brain and nervous matter, to which it is essential, and also, no doubt, in contributing to the supply of the earthy part of the bones. In the graminivora, therefore, whose food contains so small a portion of phosphates, the organism collects all the soluble phosphates produced by the metamorphosis of tissues, and employs them for the development of the bones and the phosphorised constituents of the brain; the organs of excretion do not separate these salts from the blood."

We have seen from the foregoing—

That the process of nutrition is carried on in an exceedingly prudent and economical manner; that the elements taken from the deciduous teeth by the absorbents are not degenerated materials, nor unfit pabulum for other tissues; that the inorganic substance—common salt—may be used over and over again, subserving an important purpose in nutrition, until it is gradually lost with the excrementitious matters; we have seen that portions of the disintegrated muscles, which are composed almost entirely of inorganic matter, may be converted into pabulum for other tissues; that the same identical phosphates may be used indefinitely by animals whose food is deficient in this essential ingredient; and finally—which is still more significant—we have seen that these lime salts, of the deciduous teeth, are taken into the circulation at the period of life when these elements are the most imperatively demanded in the *growth* of the young animal.

If these positions have been maintained, we have an abundance of analogical evidence to conclude that the cal-

cific elements of the deciduous teeth may be, and are, appropriated by the incomplete parts of the permanent teeth, or by any other tissue which may require these constituents as pabulum.

ARTICLE III.

Vulcanite Litigation.

Accompanying the November issue of the *Dental Cosmos* is a supplement embodying the answer filed in the Pennsylvania cases, in which are set up, in a form responsive to the last edition of the bills of complaint filed by the Goodyear Dental Vulcanite Company, all the defenses which the counsel in those cases have raised. This answer is printed with blanks for the title of the cause, and name of defendant, etc., thus making it immediately available wherever the *Dental Cosmos* reaches.

The variations in minor points of practice in different sections of the country render it advisable that local counsel should be employed in each case, to see that all matters of form are duly observed. Competent attorneys can be found at every point, and we know of nothing better that can be done than the submission to such counsel of the answer above referred to, as affording by very simple adaptation, a ready means, after appearance is entered, of complying seasonably with the next requirement in equity, (in other words for filing the answer,) and thus avoiding what has heretofore been so fruitful a source of disaster in these suits, to wit: *decrees pro confesso for want of an answer.*

This is intended as a comprehensive and pertinent response to the very large number of letters constantly received, inquiring as to the status of the Cummings Patent, and the progress of suits under it designed to test its validity, but to which it is impossible, by reason of their number, to send individual replies.

To omit nothing that is likely to save the dentist from embarrassment, a memorandum is appended of the order of

these proceedings, in case any action should be necessary before counsel can be reached.

First, every suit in equity must be commenced by filing a bill in the office of the clerk of the United States Circuit Court, within and for the district in which the defendant resides, or is found at the time he is served with the process (subpnœa). When such a bill is so filed, the clerk of the court issues a subpœna, which is in the following form:

UNITED STATES,
.... DISTRICT OF .... } *sct.*

THE PRESIDENT OF THE UNITED STATES.

To ....

For certain causes offered before the Circuit Court of the United States in and for the District of , in the Circuit, WE COMMAND and strictly enjoin you, that, laying all other matters aside, and notwithstanding any excuse, you personally be and appear before the JUDGES OF THE SAID COURT, at a Session of the Same Court, to be holden at , on the first Monday of next, to answer concerning those things which shall then and there be objected against you, and to do further and receive what the said Court shall have considered in this behalf. And have you then there this writ. And this you are in nowise to omit, under the penalty of FOUR HUNDRED DOLLARS.

NOTE.—The Defendant in this case required to enter appearance in the Clerk's Office of said Court, on or before the first Monday of next, otherwise the Bill may be taken *pro confesso.*

[A TRUE COPY.]

WITNESS the Honorable
Chief Justice of the Supreme Court of the United States, at , this day of 1873, and in the ninety- year of the Independence of the said United States.

....

U. S. Marshal,

....

Clerk of Circuit Court, U. S.

Until the service of this subpœna by a United States marshal or his deputy, the defendant named in the bill filed need not pay any attention to the suit; but when so served with such paper, the defendant should immediately consult counsel and see that his appearance is entered according to the requirements of the subpnœa, and, in due course, that his answer is filed. The answer must in all cases be filed on or before the first Monday of the next month after the appearance is entered, without any other notice than the Subpnœa itself; the United States Court practice differing in this respect from the Usual State Court practice, which does not require an answer without notice or rule. From this point the proceedings vary according to the views of the complainants; and as it is impossible to anticipate which one of the several courses open to them they will adopt. counsel should be consulted whenever any further step is taken.

This answer was originally filed in Pennsylvania, New Jersey, and Delaware suits, and also in a suit in Massachusetts brought against Dr. Daniel H. Smith, of Holyoke, who employed counsel at Boston. The result has been an agreement between the counsel in all the above suits to complete and try the Massachusetts suit as a test case, meanwhile suspending all proceedings in the Pennsylvania, New Jersey, and Delaware suits, involving the same defense. The test case will probably be tried in December or January next,

and the decision in that case will determine the others which depend upon it, leaving for either side an appeal to the Supreme Court of the United States to settle finally the questions raised in this answer as to the invalidity of the Cummings Patent. Under the arrangement above stated the Company have put in their *prima facia* case, and the defendant is to put in his proofs by the first of November next. Having thus explained the present and prospective situation, we have only to add: Let every dentist WAIT AND WATCH.

SAMUEL S. WHITE.

OCTOBER, 1873.

SELECTED ARTICLES.

ARTICLE IV.

Vital Actions which Play an Important Part in Dental Caries.

BY HENRY S. CHASE, M. D., D. D. S., ST. LOUIS.

The various theories in regard to the kind or kinds of action which constitute dental caries, probably have more or less of truth in them all. That the process which produces that disintegration of the dental tissues, which is usually called by the name of dental caries is wholly chemical or wholly vital I do not believe. The great number of observations which have been made in regard to the action which acids have in disintegration of the dental tissues, have well established the fact that the destruction of tooth substance is mainly produced by chemical decomposition.

I think that the greater number of the members of the dental profession believe that chemical decomposition is the *sole* process in the history of dental decay or dental caries. *Formerly* vital action had greater consideration in the production of this disease, than it has at the present time; and it is my object in this paper to present a few thoughts in favor of the vital movements which I believe undoubtedly play an important part in the process of dental disintegration, and to give to those vital movements a place in the history of this disease which I believe they deserve.

Many persons assume that all vital movements cease in the dentine and cementum when those tissues are fully formed. A still larger number declare that there is no vital action whatever in the enamel substance when *that* is fully formed. I believe that observation will establish facts that will prove their assumptions to be false. Admitted facts prove that vital processes are the sole cause of the production and completion of all the hard tissues of the teeth. And the history of the shedding of the temporary or milk teeth, proves that it is vital action alone which removes the roots and whole body of the dentinal crown. It is easily seen then that it is a living movement that builds up the tooth structure to its highest perfection; and also as patent that it is the same process, in a different direction, that takes down, particle by particle, or cell by cell, that same edifice which was so beautifully erected. Microscopical observations have proven that a barrier of defense is often interposed between a cavity of decay and the dental pulp, by an increased calcification of the dentine. Here is a vital action again; and this action takes place in the teeth of the middle aged, as well as in those of the young. Again, in cases of mechanical abrasion, where the teeth are worn down below the thickness of the enamel, we often find the surface of the dentine almost as hard and polished as the enamel itself; and this density of the dentine does not extend to a great depth, but on the contrary is generally limited to a thin shell of that portion of the dentine which is liable to

the destructive abrasion; looking very much as though the tooth was endeavoring to protect itself by packing its tubuli with calciferous matter, and thereby forming a wall of defense.

In *spontaneous* abrasion, or that which is neither chemical or mechanical, may not the loss of substance be by *vital* action, or absorption? I think it very probable, as it would only be in harmony with the foregoing facts, and I believe that this heretofore obscure condition will be found, on further investigation, to be the *result* of vital absorption, whatever the exciting *cause* may be.

Some of the most careful observers declare that they have known, in their own experience, the absorption of dentine under a perfect plug to take place to the extent of exposing the dental pulp; the exposure taking place absolutely without dental decay, and to such an extent that there could be no mistake about it. A large number of intelligent men are quite sure, from a great number of observations, extending over many years of experience, that the permanent teeth of the adult may become less dense in the structure of the dentine than the same teeth were at a former period; in fact, an interstitial decalcification of that tissue having taken place. These facts prove, then, that the two opposite processes of calcification and decalcification, may and do take place in the perfected hard tissue of the teeth; and furthermore, that the basal structure itself, on the animal portion of the dentine, may be removed without chemical action.

Besides the foregoing facts, I wish to describe a condition of the enamel and dentine which I have very many times observed, namely: A black or brown spot is seen on the proximate surface of a molar or bicuspid tooth; it is smooth, hard and glossy: in fact, seems to have as dense a surface as glass, or as the uncolored and perfect enamel on the same tooth. A fine excavator, in passing over it, detects no abrasion or disintegration. On cutting into this discolored portion, the tissue appears as solid, for a little distance, as ordinary enamel. The *dentinal* surface of this enamel is

somewhat lighter colored than the exterior. As soon as the *dentine* is reached we observe a softer condition, but the dentine is not discolored; still, it seems somewhat decalcified. On proceeding a little further we find this tissue still softer, apparently caused by a greater decalcification, and then we come again to normally hard dentine. In all this, there is evidently no loss of *basal* structure, either of enamel or dentine, but there is a loss of substance, and this is in the lime salts of the dentine. It is apparent that there has been no *external* loss of tooth substance.

There has been no chemical processes taking place, but there has been a vital movement in the interior of the tooth, in fact among the tubuli themselves, resulting in the process called absorption. The calcareous elements have been carried away through the interior vessels of the tooth, and not by a chemical wasting away from the exterior. A progressive history of this diseased condition, would result in showing that after a longer period, the exterior blackened surface would show signs of disintegration; the surface would become roughened, little pits would be found in it, and on cutting it with an excavator the enamel would be found softened and granular; it would easily break down under the instrument, and show discoloration as deep on its dentinal surface as on its exterior. Beneath the enamel the dentine would show a brownish discoloration, and an entire decalcification for a greater or lesser distance, until the normally hard and healthy dentine is reached. Now in this subsequent history of this disease, we probably have more or less chemical action to account for, and on *exterior* loss of substance produced by it; and this exterior chemical action of acids on the enamel will undoubtedly progress towards the interior or dentinal portion of the tooth, as rapidly as a fresh surface is presented by the washing or wasting away of the decomposed tissues.

Pertinent to the subject would be the question, what has caused the condition of things corresponding to the earlier history of the tooth described? I answer *necrosis* of the

enamel was produced by pressure of a contiguous tooth, causing the circulation of the blood plasma to cease in the basal structure of the enamel, and discoloration taking place as a consequence of necrosis, as usual. The irritation or inflammation consequent on, or simultaneous with this necrotic process, caused the vital movement in the dentine which carried away its lime salts. It must be remembered that irritation of a tissue may produce, under apparently the same circumstances, either of two opposite vital movements; namely a loss of substance, or an increase of substance. This is known to be the case in the bones of the body, and in its softer tissues.

In the teeth themselves, exostosis is caused by the irritation of a dead and decomposing pulp, and at other times absorption of the cementum and dentine of the roots takes place from the same cause.

I have already instanced the absorption of dentine under a plug which had irritated the dental pulp by the thermal changes produced by the conducting powers of the metal. At other times the same irritation produced by the same cause, calls into activity those vital movements which protect the pulp by a new deposit of dental tissue between the pulp and the plug. And here we will call to mind again, that result of vital activity which interposes a denser wall of dentine around a carious cavity, in which chemical processes are in the active destruction of tooth substance.

With these facts before us, is it not probable that in many cases of chemical disintegration of the teeth, that the irritation produced in the dental tissues causes a vital movement resulting in rapid decalcification of the dentine, and perhaps, also absorption of the basal or animal substance of that tissue, instead of the opposite process of extra deposition of lime salts in the dentine as a barrier to the decaying process. Or, in other words, is it not probable that the irritation produced in a cavity of decay, by the decomposition of food, or other organized substances causes, in many cases, a *vital action* which results in *absorption* of the lime salts in

near proximity to the scene of action, instead of the opposite process of super calcification.

It seems to me, from the foregoing observations, that, taking a broad view of the process of dental caries, we must give to vital action an important place in its history.

In conclusion I wish to say that I have read Dr. Chandler's translation of Leber and Rottenstein's "Researches on Dental Caries." These authors give great importance to the influence produced by the leptothrix buccalis which they say is almost invariably found in all carious dentine and enamel. This fungus is also found upon the tongue and upon the gums of persons who are not particular in cleansing the mouth daily. My conclusions, taking their *observations* as correct, which I believe they are, lead me to consider the leptothrix as an agent which cannot initiate dental caries, but as a concomitant of the disease may accelerate its progress. And I would here take occasion to heartily recommend the work of the authors on this subject to my professional brethren.—*Missouri Dental Journal.*

ARTICLE V.

Swallowing Artificial Teeth.—Death and Autopsy.

BY E. D. SMITH, M. D.

Some years since, in the month of May, I received a telegram to go immediately to the western part of the State of New Jersey, to see a patient whom report said was dying. Four hours' ride by rail brought me to the bedside of the sick one, who proved to be a young married lady, Elizabeth S———, twenty-two years of age, whom I had known from youth.

She was greatly emaciated; a cold, clammy sweat stood upon the surface of her skin, which was white as snow; her bright black eyes were deeply sunken, with other marked symptoms of approaching dissolution. With a tearful eye and tremulous voice she gave me a history of her case, as

follows: Four years previous she was married, with bright prospects for a happy life, but two weeks subsequently the young bride was a widow. Her husband missed his step and fell from a car in motion, and the entire train passed over his body, killing him instantly. The shock upon the nervous system was terrific, and from it she never fully rallied. Two years subsequent to this, she was again married, and one year of happy married life had passed when she gave birth to a fine male child during her labor, which was severe and protracted. Puerperal convulsions supervened. This complication her attending physician thought advisable to treat with copious blood-letting. The last convulsion she had, from the description given me by her mother, was terrific, lasting full twenty minutes. During this severe paroxysm she struggled fearfully, and from all appearances was choking to death. The physician who was present ordered the nurse to give her a spoonful of some fluid medicine he had just prepared. The effort to swallow this caused her to become fairly black in the face, strangling as though something was pressing upon the epiglottis, so as to entirely prevent the air from entering the lungs. During this exciting and dangerous condition, which lasted for near a minute, the patient placed her hands to her throat, as if endeavoring to tear it open; when, after an almost superhuman effort, relaxation ensued and respiration was resumed. The convulsions gradually decreased and finally ceased entirely, when her reason was again restored. Her throat now became very sore and inflamed, as though something rough had passed through and irritated it, and felt as though a foreign substance was lodged there.

When consciousness was fully restored she said to her mother: "Where are my teeth ? I fear I have swallowed them!" referring to a partial set of four teeth, which had been inserted by a gold clasp to the molar teeth a short time previously. Her mother smiled and said: "No, my child, this can not be ; it would be quite impossible for you to swallow them;" but the teeth could nowhere be found.

Her physicians, two of whom were in attendance, came in soon after. She told them her suspicions, for which she received only their ridicule. They informed her that it was an impossibility. Thorough search was then made for the teeth, but they could nowhere be found. The doctors laughed at her "whim," as they called it, and *absolutely refused to make an examination of her throat* (though urged to do so by the patient,) to see if it was lacerated or inflamed, and to ascertain by ocular evidence if her false teeth were there.

The patient remained it this condition for *three* days, her food in the mean time being fluids only. At the end of this time, by order of her physician, she ate a small piece of beefsteak. The act of swallowing this solid food pressed upon the teeth, which were at this time lodged in the pharynx, and by the peristaltic motion of the œsophagus, the portion of food, teeth and all, were carried down to a point near the cardiac orifice. This point, it seems, they could not pass, the hook of one end of the clasp to which the teeth were attached penetrating the œsophagus and remaining in this position.

For three months this patient lived in this condition, but gradually becoming weaker and weaker, and nearing the confines of her narrow home. Her physician was in daily attendance, and in the meantime was treating her for indigestion, general debility, incipient phthisis, etc., etc.; he always strongly and persistently denying the presence of the teeth, and the impossibility of her swallowing them.

It was at this stage of her misfortune (I will not say disease, for such she had not) that I was called in council. After hearing the history of her case, and learning all the facts connected with it, I made a thorough examination, and before concluding my investigations, satisfied myself that her suspicions were well founded; that her false teeth had in reality been swallowed; that it was this body that had nearly strangled her at the moment; that by giving her the liquid and the food already mentioned, it had been at once moved down so low as no longer to keep up the spasm of the

muscles of the throat, which, otherwise, would have caused suffocation; that the teeth were now low down in the œsophagus, and probably near the cardiac orifice, and were the real and only cause of her sickness.

I candidly expressed my convictions to the attending physician; and for thus asserting what I honestly believed, I received from the doctor only insult, centempt, and derision; and was sneeringly asked by him how it was possible for any one to swallow even a partial set of false teeth? and was told that I was old enough, and had had experience enough, to know better. He said it was simply ridiculous for me even to suggest a thing so utterly impossible.

I replied, that the probabilities were that the patient would live but a short time, and a *post-mortem* examination would settle the question between us. To this proposition he readily assented; and I left the patient in his hands and returned to the city. Two weeks subsequently the physician and myself were again face to face beside the lifeless body, I insisting upon the correctness of my first impressions, and he as strongly maintaining his previously expressed opinion, that her *teeth* were not there. The autopsy was made; and this, ladies and gentlemen, was the result of the examination of this exceedingly interesting case. [The doctor here exhibited the plate and teeth to the members of the academy.] You will perceive the teeth are four in number; and that they were lodged in the œsophagus, about two thirds the distance from the pharynx to the cardiac orifice. The clasp you see on one end of the plate had pressed against the œsophagus with such force that it caused first inflammation and ultimately ulceration; the clasp penetrating the side of the œsophagus forming a hook, which prevented the teeth from entering the stomach, where possibly they might have passed the alimentary canal, and thus have saved her life. Now I hesitate not to say, that this patient was sacrificed by the obstinacy of the doctor in refusing to examine the case, when his art or skill might have been of service. This omission of duty on his part cost this beautiful young

wife and mother her life. Had he thoroughly examined the patient's throat, after the convulsions had ceased, he would have discovered the teeth in the pharynx, where but little skill would have been required to remove them—*N. Y. Med. Review.*

ARTICLE VI.

Gelseminum in Odontalgia.

Gelseminum sempervirens is a plant growing in the Southern States of North America. Its active properties were discovered by accident. It has been for many years past used in America, chiefly by irregular practitioners. A few months ags I happened to hear of its being employed with very great success in a case of pains in the jaw from decayed teeth, and I determined to make some inquiry into its therapeutical virtues. Mr. Jeffs, the apothecary of St. Bartholomew's Hospital, very kindly prepared for me a tincture by macerating for a week an ounce of the root with eight ounces of proof spirit. All the following observations were made with this preparation.

The cases in which I have found this drug of most use are those of bad tooth-ache, which the patients themselves, and even some practitioners, call neuralgia. Short notes of some of these cases follow.

Mary L——, seventeen years old, came March 10th, 1873, complaining of shooting pains in the right side of the face, which had lasted for nine weeks. There were many decayed teeth. She had taken citrate of iron with benefit, but the pains returned when the medicine was left off. Ordered to take ten minims of the tincture of gelseminum in water every three hours. Came on March 13th, saying that the pains had ceased completely the day following the first administration of the drug. To take now instead the quassia and iron mixture of the hospital.

Emma B——, aged twenty, came on January 6th, 1873, complaining of pain in the lower and upper jaws, lasting

three weeks, and in the head. Last night had no sleep. The pains last two or three hours and then cease. Many decayed teeth in both jaws. To take fifteen minims of the tincture of gelseminum in water, every three hours.—January 9th: Pains much relieved; eating brings them on again, "it strikes cold." To continue the gelseminum.

Richard T——, aged, fifty-three, came on March 22d, 1873, complaining of shooting pains in the upper jaw since Christmas, coming on about four o'clock every day and lasting till midnight; many decayed teeth. To take twenty minims of tincture of gelseminum, in water, every three hours—March 26th; Pains ceased on the 23d of March, the day after the first visit. To take the quassia and iron mixture three times daily.

Fanny S——, aged thirty-eight, came on March 24th, 1873, complaining of pains in the face lasting for fourteen days; throbbing, paroxysmal; gums swollen; many decayed teeth. To take twenty minims of tincture of gelseminum, in water, every three hours. She came again on March 27th, saying the pains were bad all the night of the 24th, but ceased on the 25th, and had not returned. She now only feels weak. To take the quassia and iron mixture.—*J. W. Legg, M. D., in London Lancet.*

ARTICLE VII.

Amalgam Fillings.

BY THOMAS FLETCHER, ESQ., F. C. S.

The series of experiments which have now been carried on for a considerable time have brought prominently forward one serious fault existing in a large number of amalgams, to which sufficient attention has not been paid, and to which a great number of failures may be attributed, possibly more than may be fairly referred to shrinkage. This fault is a strong tendency to assume a spheroidal form whilst soft, after the filling has been inserted, resulting in

a rounding of corners, leaving frequently a considerable space in the most dangerous and unexpected places. As may be imagined this occurs to the greatest extent when the amalgam is used very soft, and the use of glass tubes of sharp triangular forms shows this fault with many amalgams in a most glaring manner, although they may be practically free from absolute shrinkage of bulk. In the glass-tube test suggested by me some twelve months ago it will be found that many amalgams apparently shrink near the surface in a well-defined ring, which only extends a short distance down. As this, from its purely local character, cannot be entirely attributed to shrinkage, a series of experiments was instituted with sharp angular tubes, which at once proved that the greater part of the fault was caused by the alteration of form and tendency to round off any angles in which the amalgam had been packed. The round tube test, therefore, although a trustworthy guide in the choice of amalgams, does not give what may be called the spheroidal test in such a clear, distinct manner as sharp angular ones, which should be taken in preference in cases of exact experiment for comparative value.

The power of an amalgam to lie absolutely dead in position when packed is, so far as my experiments go, much more important than the question of moderate shrinkage, and one to which special attention should be paid, any fault in this respect resulting in the immediate penetration of fluids down, by any angles, to the bottom of the cavity and the immediate lifting of the plug by capillary force. An amalgam of this kind can, therefore, never make a solid, firm plug, and its existence as a protection is short, whatever value it may have as regards absence of shrinkage. It appears to me that the moisture which immediately penetrates under the plug by capillary action worked backwards and forwards by the intermittent pressure in mastication, and that the plug can never be steady and firm from the day it was inserted. This explanation would account for the appearance of a cavity from which an imper-

fect amalgam plug has been removed, the decay having progressed to the greatest extent at any angles in the cavity, extending more or less over the whole of the surface. If the failure had been caused entirely by shrinkage the decay would have progressed equally all over the surface, which is by no means the case where an amalgam of this class has been used.

The defect may be partially remedied in the most imperfect preparations by using them as free from mercury as possible, by thorough condensation in the angles and narrower parts of the cavity, and by a careful, firm burnishing before they became thoroughly hard. They cannot, however, be depended on as, whilst soft, the amalgam springs back when the pressure of the burnisher is removed and the moisture penetrates immediately; in this case no amount of after pressure will remove it, and a few years afterwards comes the end of the filling, and, unfortunately, often the end of the tooth also.—*British Journal of Dental Science.*

ARTICLE VIII.

Digestive Power of Saliva and Pancreatic Juice during Infancy.

The recent experiments of Korowin, of St. Petersburg, upon the saliva of newly-born infants and sucklings, in regard to the time of its very earliest appearance and its fermentative power at different ages, well deserve the careful attention of all interested in the dietetics of children. Korowin (*Centralbatt,* 1873, No. 17 and 20) adopted the plan of giving to infants pieces of compressed sponge to suck, and then squeezing from these whatever saliva, if any, might be collected. In this way he was able to determine that saliva may be obtained from the mouth of a child only a few moments born. The secretion is, however, very scanty; indeed, during the first two months of life collecting the saliva is a most difficult process, and demands great perse-

verence, not more than one cubic centimetre being obtained at one time (fifteen to thirty minutes) in any experiment.

From the end of the first month of life, and especially after the sixth week, the amount of saliva which may be removed increases much. In the third month as much may be obtained as in the first month in one tenth the time.

In the fourth month one to one and a half cubic centimetres can be collected in from five to seven minutes, and it is at this age that the saliva begins to flow visibly from the mouth of the child.

The saliva of the child possesses its diastatic or fermentative property from the time of its appearance—that is, immediately after birth. The action of the saliva, however, is not always equally powerful; on the contrary, it increases steadily and rapidly with age up to a certain point, as Korowin was able to determine by watching children for months. It seems certain that while the diastatic power of saliva increases up to the eleventh month of age, it then reaches its maximum—that is, a given amount of saliva of a child of eleven months and of an adult respectively, decomposes equal quantities of starch-paste.

Korowin has also turned his attention to the pancreas and its secretion in newly-born children and in sucklings. The pancreas was removed from the bodies of children who had died of various diseases—at various intervals post-mortem.

An artificial pancreatic juice was then prepared in the usual manner, and the amount of glucose formed estimated quantitatively. The results obtained are very important.

In a child of one month the action of pancreatic juice upon starch is absolutely *nil;* it is first demonstrable in the second month, but very feeble; at the end of the third month of life it has become sufficiently powerful to make a quantitative estimation possible of the sugar formed. The diastatic action of the pancreatic juice once acquired, steadily increases in intensity with age and reaches its maximum at the end of first year of life.—*Druggists' Circular.*

ARTICLE IX.

When to Lance the Gums.

Dr. J. L. Smith says, in his late work on "Diseases of Infancy and Childhood:" "The gum lancet is now much less frequently employed than formerly. It is used more by the ignorant practitioner, who is deficient in the ability to diagnosticate obscure diseases, than by one of intelligence, who can discern more clearly the true pathological state.

Its use is more frequent in some countries, as England, under the teaching of great names, than in others, as France, where the highest authorities, as Rilliet and Barthez, discountenance it.

"It is well to bear in mind, as aiding in the elucidation of this subject, the remark made by Trousseau, that the tooth is not released by lancing the gum over the advancing crown. The gum is not rendered tense by pressure of the tooth, as many seem to think, for, if so, the incision would not remain linear, and the edges of the wound would not unite, as they ordinarily do by first intention within a day or two. This speedy healing of the incision, unless the tooth is on the point of protruding, is an important fact, for it shows that the effect of the scarification can only last one or two days. The early repair of the dental follicle is probably conservative so far as the development of the tooth is concerned. It may help us to understand how active, how powerful, the process of absorption is, if we reflect that the roots of the deciduous teeth are more or less absorbed by the advancing second set, without much pain or suffering from the pressure. If the calcareous particles of the teeth are so readily absorbed, what is the foundation for the belief that the fleshy substance of the gum is absorbed with such difficulty? Too much importance has evidently been attached to the supposed tension and resistance of the gum in the process of dentition.

"Follicles in the period of development are especially liable to inflammation. We see this in the follicular sitom-

atitis and enteritis so common when the buccal and intestinal follicles are in the state of most rapid growth. Does not this law in reference to the follicles hold true of those by which the teeth are formed, so that the period of their enlargement and greatest activity, which corresponds with the growth and protrusion of the teeth, is also the period when they are most liable to congestion and inflammation?

This fact affords a better explanation of the frequency of the so-called laborious or difficult dentition than that it is due to the resistance which dental evolution encounters from the gums. "If there are no symptoms except such as occur directly from the swelling and congestion of the gum, the lancet should seldom be used. The pathological state of the gum which would, without doubt, require its use, is an abscess over the tooth. As to symptoms which are general or referable to other organs, as fever and diarrhœa, the lancet should not be used if the symptoms can be controlled by other safe measures. All co-operating causes should first be removed, when in a large proportion of cases the patient will experience such relief that scarification can be deferred.

"If the state of the infant is such that life is in danger, as in convulsions, or there is danger that the infant will be permanently injured or disabled, as by paralysis, every measure which can possibly give relief should be employed without delay. In these dangerous nervous affections, therefore, the gums, if swollen, should be lanced. I know no accidents of dentition which require prompt scarification except suppurative inflammation of the gums, convulsions, and paralysis. In other cases the operation may be safely postponed till other measures have been employed.—*Med. and Sug. Report.*

ARTICLE X.

The Diarrhœa of Teething Children.

BY DR. W. H. DAY.

The treatment of diarrhœa in teething children is apt to be looked at from a one-sided point of view; the quickest

way to arrest it. We have diarrhœa, 1, from dental irritation; 2, from indigestion caused by over and under feeding; 3, from atmospheric changes. Then, too, the diarrhœa may be of a simple inflammatory, choleraic, or dysenteric character; each variety demanding a different plan of treatment.

Astringents, as a rule, are to be condemned. The diarrhœa will continue in spite of them, unless other precautions are taken. If the motions contain mucus and are slimy, and there is a trace of blood and redness about the anus, chalk mixture and kino will be of no service, nor will bismuth, acids, or oxide of zinc. The diet is primarily at fault in these cases, and undigested food has passed into the bowels. Warmth and complete rest, with a dose of castor oil in such cases, is the most appropriate treatment, though the gums may require puncturing, and a grain each of hydrargyrum cum creta and Dover's powder may be necessary. Occasionally a quarter grain of calomel, with a grain of Dover's powder, will be found of great value. Among hospital patients a large number of cases of diarrhœa are attributable to over suckling, and suckling by mothers in delicate health. The return of the catamenia is no hindrance to their nursing, and even menorrhagia in a mild or severe form. Remove all children suffering from diarrhœa from the breast, and let them have cow's milk diluted with lime water, previously warmed and given in a well rinsed bottle, and you will cure the diarrhœa.

Many children are reared entirely on Swiss milk, and this will now and then agree far better than cow's milk. Sometimes milk, in any form and however pure, will keep up the diarrhœa, and then cold barley water, or cold water thickened with isinglass will be necessary, or thin water arrowroot, to which a few drops of brandy may be added should the child be exhausted. Sometimes a powder containing two or three grains of rhubarb and carbonate of soda will neutralize the acidity which has resulted from the fermentative products of digestion, and set the little patients right with magical quickness. If the evacuations are free from

mucus and blood, and there is no pain, a mild mixture of sulphate of magnesia and tincture of rhubarb may be prescribed in some cases with advantage. A drop of ipecacuanha wine in plain water, or mucilage and water, has been recommended, and it will often succeed.

Children are liable to diarrhœa at a certain season of the year from heat, and the excitement of travelling, and change from healthy country places or the seaside to the contaminated air of London.—*Brit. Med. Jour.*

ARTICLE XI.

Treatment of Morbid Dentition.

BY E. D. DRAKE, M. D.

I had occasion last January to prescribe for the patient of another physician, a boy æt. one year, suffering from derangement of the stomach and bowels while teething; his stomach was very irritable, bowels moving frequently, head hot and temper fretful; he had some fever, but temperature not remembered. He had been taking for several days a mixture of paragoric, lime water and milk, without any permanent benefit. Ordered.

℞.	Pot. bromidi pulv.	grs. xv.	
	Pot. nit. pulv.	grs. xij.	
	Zinci. oxidi.	grs. ij.	M.

Divide in chart No. vi. S. One powder every four hours until bedtime.

Added nit. pot. on account of the fever; in twenty-four hours he was greatly improved; stomach and bowels quiet, fever abated and temper playful; continued brom. pot. and he had no further trouble. At the next eruption of teeth he had the same symptoms, which yielded readily to the same prescription without any special treatment directed to the alimentary canal, the vomiting and purging being restrained by quieting the nervous irritability, in other words removing the cause. The above treatment is based on the idea that the anorexia, vomiting and purging are reflex

symptoms dependent on irritability of the nerve centres, which unchecked is liable to eventuate in convulsions, congestion or inflammation of the brain, or inanition from derangement of the digestive function.

In my opinion the treatment is safe, and can be kept up some time, and is really more valuable in the prevention than the cure of bad symptoms. I have not used this treatment extensively, but am pleased with it thus far, and emboldened to ask a trial of it in this disease in the way of prophylaxis and cure; the oxide of zinc is combined in the above from its supposed sedative effects, and I should think that a definite compound of bromine and zinc would be useful and convenient in various nervous affections. The "child of the period" is an interesting study, and needs attention as well as the girls and boys of the period; begotten of nervous parents he has a double inheritance of nervous predisposition, with a lack of physical development in other respects.—*Med. and Surg. Reporter.*

EDITORIAL, ETC.

Dental Education.—The dental colleges throughout the country are now in full operation, so far as the preliminary course is concerned, the regular lectures in the majority of them beginning on the 1st of November.

Owing to the financial crisis the attendance at both medical and dental colleges may be somewhat affected during the present session; but so far, the session at the Baltimore College of Dental Surgery has opened with a very good prospect for a large class, the number of students at the time we write (October 27th,) being in excess of some previous years, and nearly equal to last year, when there was a large class in attendance. Taking into consideration the financial condition of the country, and especially of the Southern States, the friends of this institution are very much gratified at this evidence of its prosperity, especially as the majority of the second course students enter on or near November 1st of each year. Among the number already matriculated are four students from foreign countries.

Dr. Taft, in the October No. of *Dental Register*, truly remarks that "the subject of dental education is one that ought to elicit the highest interest of every dentist. Every one should feel the importance of the subject enough to examine the character and standing of our educational institutions, and seek, where there are defects to have them corrected, and sustain those that are most efficient in the work.

"Unfortunately there is a great want of interest in this matter, and in many cases not only a lack of interest, but an active opposition, more or less pronounced, either in word or act. Many dentists will discourage students, and often prevent them from entering a dental college; affirming that they will have better opportunities for obtaining the desired knowledge in an office. Others manifest an entire indifference as to whether their stu-

dents take a college course or not, giving them little or no preparation for it, and manifesting little or no interest what institution, if any, the student enters.

"There are other influences constantly operating to prejudice the best interests of professional education, such as an over-anxiety to secure large classes, and to graduate the largest number, irrespective of the character of the material composing the classes

"An emulation as to who shall accomplish the greatest good is always laudable; a purpose is always best accomplished by doing thoroughly that which is attempted."

Action of Nitrous Oxide.—The *Archives de Phys.* states that Joylet and Blanche have obtained the following results from their experiments on this subject. Chemically pure nitrous oxide will not support the respiration either of animals or plants, as they cannot decompose the gas. When breathed in a pure state by animals, it causes asphyxia and death, with all the symptoms usually occasioned either by strangulation or by the respiration of an inert gas, such as nitrogen or hydrogen. Nitrous oxide causes death in nearly the same time as these other asphyxiating agents. Nitrous oxide has no special anæsthetic action. The anæsthesia which it may produce when inhaled in a pure condition is only due to want of oxygen in the blood. Insensibility appears when the oxygen in arterial blood is reduced to less than 2 or 3 per cent. Arterial blood is then very dark, and contains 30 or 40 per cent. of nitrous oxide. Animals can live and show no alterations of sensibility while breathing mixtures of nitrous oxide and oxygen, in the same proportion as nitrogen and oxygen in air. The arterial blood then contains about 30 to 35 per cent. of nitrous oxide. Birds placed under a bell-jar filled with this mixture, behave exactly like those placed in a jar of the same size filled with air, and die after having exhausted the oxygen to a similar extent and formed a similar amount of carbonic acid. As nitrous oxide is an irrespirable gas, and does not possess the anæsthetic properties which have been attributed to it, the authors conclude that its employment cannot but be dangerous, and ought, on this account, to be excluded from medical practice.

An Easy Method of Roughening Plugger Points.—Dr. W. S. Elliott, in the *Missouri Dental Journal,* describes a simple process which may prove useful to many practitioners. It is as follows:

"It has been suggested that a *broken* surface for a plugger point was in many respects superior to an ordinarily serrated one. This I believe to be true; but to break a point that it may be of an oval or spheroidal shape is no doubt impossible. A surface may, however, be produced which in all respects is equal to a broken one by the following method: First, file up the point to the shape desired and finish on a fine emery wheel; take now a piece of new emery paper of moderately coarse grade, lay it upon a well tempered anvil, and while the steel point is yet soft, place it upon the paper and with a smart blow of a hammer drive the point upon the emery: indentations will thus be made. Lift the point to a fresh surface on the paper and drive again; repeat the operation until the point is uniformly indented. For spherical points the paper may be bent at a right angle and placed in a similar angle of the anvil, when the *sides* of the point will receive the indentations equally as well defined as the extreme end. Harden without drawing the temper and examine under a glass."

MONTHLY SUMMARY.

A Rare and Extraordinary Case.—The *Irish Hospital Gazette* records an extraordinary case recently brought before the Dublin Pathological Faculty by Professor R. W. Smith of Dublin University. The disease under which the woman succumbed, whose skeleton he exhibited, was one of rare occurrence, and difficult alike to diagnose, treat, or even name. At the time of her death the woman was 45 years old. Fifteen years previously she had been sent to jail for some offense, which was probaly committed while insane, as shortly afterward she was transferred to a lunatic asylum. During the first ten years of her residence

there, nothing remarkable about her was noticed, and she was employed in washing the floors, etc. At the end of this period she ceased to be able to work, and remained in bed for the remaining five years of her life, gradually becoming more feeble, and dwindling away in statue until she became about one half of the height she was originally. She did not complain of any pain; her limbs became coiled up in every possible shape, and she seemed gradually to disappear from off the face of the earth. She died possibly from constitutional disease of the osseous system. He [Professor Smith.] however, looked upon the condition of the bones not as a disease, but as a manifestation of an as yet unknown diseased condition. Professor Smith had weighed all the bones individually; the total weight of the skeleton [including the cranium] was two and one-half pounds, which equaled about .fourth part of the weight of a child at birth. The bones were extremely light, soft, fragile, and atrophied in every respect. The number of fractures were prodigious. The ribs were in a hundred fragments. The head of the humerus was bent; the fibulæ were curved; the thigh bones and pelvis were huddled up together; and the bones of the vertebræ thinned and worn away across the front of their bodies. The lower jaw was atrophied and broken into three fragments; the base of the skull was cribiform all through; and he [Professor Smith] believed that if the woman had lived longer not a vestige of a bone in her body would have been left. As to the nature of this disease he [Professor Smith] believed that it was identical with rickets occuring in the adult, and although that opinion might appear heretical to some, yet he was glad to find that in the last volume of Trosseau's Lectures on Clinical Medicine that that distinguished author had expressed his opinion that osteomalacia and rickets were one and the same disease.

Treatment of Salivation by Atropia.—Heidenheim has recently investigated the action of atropine on the salivary secretion, and has shown its effects to be [1] to annul the influence of the corda tympani upon the secretion, but [2] not to interfere with its influence upon the circulation, nor [3] to prejudice the secretion by irritation of the sympathetic, thus not destroying the gland-cells. Following H's investigations, Ebstein has applied atropine to the treatment of a case of salivation with remarkable success.

A patient was admitted to the hospital at Breslau, who some months previously had suffered an attack of hemiplegia. At the time of admission traces of the paralysis still remained, with some drooping and partial immobility of left half of the mouth. From the corner of the mouth saliva flowed profusely, and was too copious to be accounted for merely by the paralysis of the

orbic. oris. According to the patient's statement, this discharge had persisted for about a month, coming on some months after the occurence of the hemiplegia. Some drooping had accompanied the paralytic stroke at first, but afterwards this ceased.

The atropine was administered at first in pills, each containing 0.0005 atrop. sulph. From one a day the dose was gradually increased to 4 pills [0.002 pro. die.] The discharge of saliva was at the beginning 300 c. c. daily. With the increase of the dose the discharge gradually diminished to 275, 100, and 90 c. c. though it did not cease entirely. On stopping the drug the saliva flowed as at first. The atropia was next administered subcutaneously over the submaxillary gland of the paralyzed side; 0.0003 gramme injected had no effect. The dose was increased to 0.0006, and by degrees to 0.0016. One or two minutes after injecting 0.0006 the patient noticed that his mouth was drier, and in from 5 to 7 minutes the flow had ceased entirely. After the dose of 0.0016 there was no saliva from 4 o'clock P. M. till 6 the next morning. Afterwards the flow recurred. When the injection was made over other parts of the body the effect was delayed to about twice the length of time. This was also the case when the atropine was dropped into the conjunctival sac.

The writer believes that the proper narcotic for salivation is atropia, and in conclusion thinks he can "recommend" its use in the treatment of salivation to his colleagues with good conscience."— *Wilh. Ebstein, Berl. Klin. Wochenschr.*

Hypertrophy of the Tongue.—Dr. G. Mass reports that five cases of hypertrophy of the tongue have occurred during the past year in the surgical clinique at Breslau. The enlargement was in each case congenital, sometimes involving the entire organ, at others being limited to a latteral half. The part affected was in each case removed by means of the galvano-caustic ligature. The microscopical examination of the removed part showed that in one instance (that of a child two months old,) the enlargement was the result of simple hyperplasia of all the textures of the tongue. In three other cases there was found to be a new formation connective tissue and blood-vessels, so that the tongue was enveloped in a spongy cavernous mass. This formation of new texture had attained the greatest magnitude in the case of a patient twenty-one years old, and was the least marked in the case of a child three years old. The writer concludes that hypertrophy of the tongue begins always with simple hyperplasia, to which is afterwards added, as a secondary lesion, an increased development of the connective tissue and blood-vessels—this abnormal growth being stimulated by the

pressure the enlarged organ receives from the surrounding parts, the pressure being so great in some instances as to force it from the mouth.

[*Note.*—Hypertrophy was the term formerly employed to indicate any abnormal enlargement of the body. The distinction indicated by the term *hyperplasia* was first made by Virchow to represent an abnormal enlargement arising from an increase in the number of the original elements. "Hypertrophy" was then limited to that form of enlargement depending upon the increase in the size of the primary elements, such for instance, as is seen in the pregnant uterus.]—*Boston Med. & Surg. Journal.*

Poisonous Character of Nitrous Oxide—In the *Archives de Physiologie* Drs. Joylet and Blanche publish the results from their experiments on this subject:—

Chemically pure nitrous oxide will not support the respiration of either animals or plants, as they cannot decompose the gas. When breathed in a pure state by animals, it causes asphyxia and death, with all the symptoms usually occasioned either by strangulation or by the respiration of an inert gas, such as nitrogen or hydrogen. Nitrous oxide causes death in nearly the same time as these other asphyxiating agents. Nitrous oxide has no special anæsthetic action. The anæsthesia which it may produce when inhaled in a pure condition is only due to want of oxygen in the blood. Insensibility appears when the oxygen in arterial blood is reduced to less than 2 or 3 per cent. Arterial blood is then very dark, and contains 30 to 40 per cent of nitrous oxide. Animals can live and show no alteration of sensibility while breathing mixtures of nitrous oxide and oxygen, in the same proportion as nitrogen and oxygen in air. The arterial blood then contains about 30 to 35 per cent. of nitrous oxide. Birds placed under a bell-jar filled with this mixture behave exactly like those placed in a jar of the same size filled with air, and die after having exhausted the oxygen, to a similar extent and formed a similar amount of carbonic acid. As nitrous oxide is an irrespirable gas, and does not possess the anæsthetic properties which have been attributed to it, the authors conclude that its employment cannot but be dangerous, and ought, on this account, to be excluded from medical practice.—*Med. & Surg. Reporter.*

Ice in the Treatment of Facial Neuralgia.—M. Wenteritz reports a case of very intense facial neuralgia which resisted every mode of treatment, that finally yielded to the application of ice along the affected side of the face laid on at periods of five minutes. The pain disappeared in twelve hours and after an interval now of ten months, has not returned.—*Med. Press.*

Bleaching Wax—Wax is freed from its impurities and bleached by melting it with hot water or steam in a tinned copper or wooden vessel, letting it settle, running off clear supernatant oily-looking liquid into an oblong trough with a line of holes in its bottom, so as to distribute it upon horizontal wooden cylinders, made to revolve half immersed in cold water, and then exposing the thin ribbons or films thus obtained to the blanching action of air, light and moisture. For this purpose the ribbons are laid upon long webs of canvas stretched horizontally between standards, two feet above the surface of a sheltered field, having a free exposure to the sunbeams. Here they are frequently turned over and covered by nets, to prevent their being blown away by winds and watered from time to time. Whenever the color of the wax seems stationary, it is collected, remelted, and thrown again into ribbons upon the wet cylinder, in order to present new surfaces to the blanching operation. If the weather proves favorable, the wax eventually loses its yellow tint. Neither chlorine, nor even the chlorides of lime and alkalies, can be employed with advantage to bleach wax, because they render it brittle and impair its burning qualities.—*Am. Artisan.*

An Ointment for Neuralgia.—Dr. J. Knox Hodge recommends the following as an application which will relieve facial or any other neuralgia almost instantaneously. He advises his friends "to send around to the druggists and try a bottle."

R.—Albumen of egg, oz. j. Rhigolene, dr. iv. Oil of peppermint, dr. ij Collodion, Chloroform, aa dr. j.—M.

Agitate occasionally for 24 hours, and by gelatinization a beautiful semi-solidified, opodeldoc-looking compound results, which will retain its consistency and hold the ingredients intimately blended for months.

In the above we find a local agent of signal potency in all neuralgic affections, and for the relief of pain generally.

Apply by smart friction with the hand, or gently with a soft brush mop along the course of the nerve involved.—*Georgia Companion.*—*The Clinic.*

Remarks on Methylene.—Dr. Richardson, speaking of this anæsthetic as rapid in its effect, says, that "from one to two drachms will induce, in the space of a minute and a half to two minutes, sufficient insensibility for a short operation, while from two to six drachms are sufficient for the production of prolonged anæsthetic sleep." The sleep induced is very gentle, and rarely attended with convulsive movement; vomiting is less frequent than from chloroform, ether, or bichloride of methylene.

Treatment of Burns.—Dr. Buck's burn-mixture, in use at Bellevue Hospital, N. Y., [*Med. Record,*] is made by dissolving two ounces gum tragacanth and four ounces gum Arabic in a pint of water, and adding a pint of molasses. Spread on with a brush, and repeat when needed. Common white paint is also used, spread over the burnt surface. Lycopodium is applied by some surgeons over the mucilage.

Pneumonia is sometimes treated with sulph. quiniæ gr. v. three times a day, and good results are reported. But pnemonia is a wonderful plaything for statistics.—*Pacific Med. and Surg. Journal.*

OBITUARY.

Editor American Journal of Dental Science:

On the 3d day of July, 1873, at a meeting of the New Orleans Dental Association the following preamble and resolutions were passed:

WHEREAS Divine Providence, in His allwise dispensation, has seen fit to allow the laws of nature to be exercised in removing from life's busy scenes and cares the very estimable gentleman Cyrus S. Knapp, D. D. S., at his residence, near Jackson, Mississippi, long before having attained that full measure of earthly existence which has been allotted to many; and

WHEREAS, in his demise society has been deprived of a useful worthy member; his wife of a loving devoted husband; his children and brothers of an affectionate father and brother; whilst his numerous friends and relations have sustained the irreparable loss of a warm and genial Friend; the Dental Profession of one of its highest ornaments; and this Association of one of its corresponding members;

Therefore be it Resolved, That we tender to his family and relations our heart-felt sympathy and condolence for their sad bereavement, and that this preamble and resolution be spread upon the minutes of this meeting, and that a copy of the same be forwarded to his grief-stricken family, and that copies likewise be furnished to the Dental Journals for publication.

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ARTICLE I.

Chemistry of the Oral Secretions and Their Action on the Teeth.

BY EDWARD C. CHASE, IOWA CITY.

(Read before the Illinois State Dental Society.)

Of all the many subjects within the boundless realm of dental science, none can be of more interest and importance to the scientific dentist than the study of the physiological and chemical properties of those fluids which continually bathe the objects of his solicitous care and pecuniary support.

The teeth, constantly washed, as they are, by fluids poured into the mouth from sundry glands, and these fluids impregnated by obnoxious gases resulting from the putrefactive decomposition of particles of food, are absolutely under the influence and control of these liquids. This being the case, then, not only the integrity of the teeth themselves, but the permanence of our operations upon them, depend upon the chemical condition of these oral secretions.

It matters not how thoroughly nature may have impacted the lime salts or closed the enamel seams, if the mixed secre

tions contain the fatal acid, whether mineral, amylacions or albuminons, the pearly citadel is besieged and will surely fall. While on the other hand, through ignorance of hygienic laws, or other obscure causes, the vital forces have been arrested or perverted from their legitimate channel, and the teeth consequently but imperfectly calcified, still they will be able to maintain their integrity of form so long as their aqueous surrounding is free from the insiduous enemy, *acid*.

Under the head of oral secretions are included the products of all those glands whose excretory ducts open within the boundary of the oral cavity; consequently we will have to consider the mixed secretions of the parotid, the sub-maxillary, sublingual and the mucous glands. These latter are named "labial," "buccal," and "lingual," owing to their location. It is this, the common or mixed saliva, that interests us as dentists in a practical point of view. To the physiologist or physiological chemist, a thorough and minute knowledge of the chemical properties, including a correct analysis of the secretions of each individual salivary gland, is not only interesting but quite imperative; but from our stand-point of observation we care more for the effects produced—if any—by the oral secretions upon the teeth, and as these are brought about by the agency of the mixed saliva, we will proceed to consider it as such.

Probably no secretion of the human body has given chemists more trouble to analyze, and none has given more varying results, than the saliva.

Even the same saliva, analyzed by the same person will frequently differ quite materially in the quantity and quality of its constituents. In making an analysis of the saliva, the first question that naturally presents itself is this: "Will it give an acid or alkaline reaction?" In two hundred examinations made by an eminent member of our profession, who is here with us to-day, upon a like number of apparently healthy individuals, he found the saliva acid in one hundred and ninety-eight cases; two cases in which it was neutral.

In most of these cases a slightly alkaline reaction was observed, however, just before eating; but as soon as the meal was over, its character was immediately changed to an acid fluid, and remained so until the time for eating arrived again. Of about fifty mouths examined by myself, two or three were found neutral and the rest acid. These latter examinations were made from one to three hours after eating. It is held that acidity of the saliva is an indication of disease; that it is abnormal. Still we find this condition present in the mouths of people who have the appearance of perfect health and teeth entirely free from decay. The fact is, most of us are living artificial lives in our dress, habits of body, and the food we eat. If we were living in a perfectly physiological state; if we took our food as furnished us by nature, before it had passed through the hands of men to be deprived of its life-sustaining elements and tissue-making principles, the results might be different; for no one will question the fact that the character of all the secretions of the body, the saliva included, depends to a great extent upon our manner of living.

By extrinsic examinations made upon animals by the experimenter heretofore referred to, he found that animals which were free to roam wherever they chose in search of food and drink, that almost invariably their saliva gave an alkaline reaction; while on the other hand, stall-fed animals, animals that were not allowed sufficient exercise, that were deprived of the beneficial influence of the sun, that were fed upon slop and kept in damp, hot stables, and were living an entirely artificial life, that the saliva of these animals gave a decidedly acid reaction.

In alkaline saliva the analysis shows the alkalinity to be due to the presence of tri-sodium phosphate. The acidity may be due to any of the following acids, viz: Acetic, lactic, oxalic, uric, hydrochloric, nitric, and sulphuric.

The three first are formed probably and become constituents of the saliva, either in the secreting gland itself, or in the mouth by the decomposition of mucus, epithelium, or food

remaining about the teeth. These acids, with hydrochloric have been found in the saliva by actual analysis. The latter —hydrochloric—is probably formed in most cases by galvanic action, which decomposes the chlorides and water, thus furnishing the necessary elements for its composition; and particularly is this the case when there are different oxidizable metals in the mouth, thus presenting all the apparatus for a complete battery.

The presence of uric acid in the mouth may be caused by retention of the urine, or by disease of the kidneys, which fail to eliminate it from the blood. Nitric and sulphuric acid have never been detected, as far as my knowledge extends, in the saliva, but nevertheless they are thought by some to be present in that fluid under certain circumstances, from the effects which are observed upon the teeth.

You probably have all seen mouths in such a condition that it would not have excited the least surprise in your minds if told there existed any chemical combination whatever—mouths filthy beyond comparison. In such mouths I not only believe the conditions are present for the formation of the two last named acids, but I believe they are formed and act chemically upon the teeth.

We know that sulphur is present in albumen and other organic compounds that exist as proximate principles of a large class of food. Now, during the decomposition of any of these substances, sulphur is eliminated, and being in a nascent state will combine either with oxygen, forming sulphur*ous* acid, or with hydrogen, forming sulphureted hydrogen, and either of these might be so acted upon by other elements as to result in the formation of sulphu*ric* acid.

Nitrogen also being a constituent of a large class of aliment, is eliminated by the decomposition of the compound, either in company with oxygen, with which it forms five different compounds, or with hydrogen, forming the well-known compound ammonia. Either of the above combinations of nitrogen are capable of further change, and may finally terminate in nitric acid.

The most reliable analysis of saliva we have, gives in 1000 parts about 990 of water and 10 of solid material. In the latter are included the organic principle ptyalin, chlorides of potassium and sodium, sulphocyanide of potassium, phosphates and carbonates, epithelium; and in alkaline saliva, tri-sodium phosphate.

The presence of sulphocyanide of potassium is proven by the blood-red tint imparted to saliva by the addition of the sesquichloride of iron. If the sulphocyanide of iron is formed, by the application of heat the color will temporarily disappear; or by the addition of bi-chloride of mercury the color is entirely destroyed.

Mixed saliva possesses other chemical properties besides alkalinity and acidity; it has the extraordinary metamorphic power of converting starch into sugar with wonderful rapidity. Numerous experiments have been made with the view of ascertaining what particular component so acted upon starch as to produce this interesting phenomenon, and all go to show that it is due to the organic principle ptyalin, together with the mucus of the mouth.

Enough has been said now to prove that the saliva exerts a great influence upon the teeth, depending upon its chemical conditions. It may cause and promote decay, or it may effectually prevent it, as the case may be. Want of time prevents us from reviewing the physiological and interesting properties of the saliva, and I will hasten to consider the one other great action it has upon the teeth, second only in importance to the part it plays in dental caries. I refer to the deposition from it of the elements composing salivary calculus, or tartar.

But few months, if undisturbed by either brush or pick, would be found exempt from this deposit; while in the large majority of those that receive the ordinary attention of a most thorough washing, at least once a day, will be found traces, at least of tartar. The normal proportion of phosphate of lime is about 6 parts in every 1000 of saliva. This proportion may be morbidly increased, of course, as Dr.

Wright found in one case 14 parts in 1000. That tartar is formed by the precipitation of this phosphate of lime and other insoluble substances from the saliva, there cannot be a doubt.

I will now quote from an article bearing directly upon this subject, written by myself and published in the *Missouri Dental Journal*, Vol. IV., No. 5.

"We find that the most reliable analysis of tartar gives from 60 to 75 per cent. of strictly inorganic matter, the balance being made up of mucus, fibrin, epithelium and water. The inorganic portion is that with which we have to deal.

We have seen that the phosphate of lime exists as phosphate of lime in the saliva; hence it is simply precipitated from this fluid, undergoing no chemical change.

The saliva from all the glands, while being secreted and passing from the mouths of the ducts, is normal, but after it has once become mixed, or even as soon as it becomes exposed to the air, it is immediately changed from an alkaline to a neutral or slightly acid fluid. This can easily be proven by any one with litmus paper. This change may be brought about in two ways: First. The acids resulting from the putrefactive decomposition of particles of food or epithelium (the presence of which is the chief if not the only cause of dental caries) coming in contact with the saliva, would instantly unite with the free soda, and, if powerful enough, decompose the lactates, setting free lactic acid and uniting with the bases, forming salts; thus, if hydrochloric acid were present, there would be formed the chlorides of calcium, sodium and potassium, with the liberation of lactic acid.

Second. The neutrality or acidity might be brought about by the carbonic acid, which passes off from the system in large quantities by each exhalation of air from the lungs. This coming in contact with every portion of the saliva as soon as it is emptied into the mouth, would tend to transform it immediately to an acid fluid; and particularly would this be the case in the mouth of one who exhaled through this cavity instead of the nostrils.

The saliva now being changed chemically, the conditions favorable to the solution of the phosphate of lime, of course, are now present, and this substance is precipitated as an insoluble powder. It now finds its way between the margins of the gums and necks of the teeth, and is slowly but constantly deposited, first in the interstices of the enamel, and thus gets a firm hold, and then layer upon layer is piled on, until, in time, if nothing interferes, there is formed a huge mass, which becomes the seat of disease and corruption, and even of animal life. Now, from whence is the carbonate of lime? We have already seen that the mixed saliva is slightly impregnated with carbonic acid coming from the lungs; this, then, might act upon the lactates of lime, soda and potassa, forming carbonates of them all, and we would have carbonate of soda and carbonate of potassa. Now it is a well known chemical law, or fact, that carbonates of the alkali metals, such as potassium, sodium, ammonium, are soluble, while the carbonates of the alkaline earths, such as calcium, strontium and barium, are insoluble. The carbonate of lime belonging to this latter class, and therefore insoluble, would be precipitated as a white powder, and, like the phosphate of lime, would lodge in all protected places on the teeth, and with it make up the bulk of tartar as found in the human mouth. During sleep the conditions are most favorable for its rapid formation; it is then that the parts are in almost perfect rest; hence it remains when deposited. Now it is that respiration proceeds through the mouth, and the supply of carbonic acid is abundant.

From the foregoing will be seen the importance of preserving the normal alkalinity of the saliva, for upon this property depends its power in retaining in solution the principal ingredient of tartar or salivary calculus.

ARTICLE II.

Dental Pathology.—BY W. L. YOUNGER, M. D.

Read before the California State Dental Association.

The diseases of the mouth and dental organs are now being so well defined, and becoming tractable to treatment,

and the necessity so apparent for preserving these organs of our blood, so important to health, beauty and comfort, that the dentist who does not put forth every effort that skill and ingenuity can devise to render extraction unnecessary, is unworthy of his profession, and should be ostracised from our respect and society. I now beg leave to present a few cases, hoping that a consideration of them may be of service.

A gentleman came to me to have his teeth extracted. He had been recommended to this by his physician, and some of the best dentists, both here and in the Eastern States; yet his teeth were perfectly sound. Two of them only had been decayed and these were well filled. There was not a single devitalized tooth in his head. But his teeth were loose and painful; the gums had receded fully one-half the length of the roots, and were swollen and spongy; pressure on them caused the exudation of yellowish pus from their margins, and there was intolerable *fœter* of the breath. The gentleman noticed the commencement of the disease fifteen years before; but, on application to the best authorities, he was told nothing could be done for them but extraction. He preferred to keep them as long as possible, and when he could bear them no longer he came to me. I passed some delicate hoe-shaped instruments up along the roots, as far as gentle pressure would carry them, and then holding the teeth with the unoccupied hand, to keep them from being pulled out, by gentle traction I disengaged black tartar, that had caused all the mischief, and which clung with considerable tenacity to the roots. I then scraped the carious edge of the alveolar process, pointed it with iodine, as also the gums, and prescribed an astringent wash. In one week he returned. Upon examination, I found, first, that the gums had resumed nearly a normal appearance; second, that the fearful *fœter* of the breath had almost disappeared; third, that there was but slight discharge of pus from a few of the teeth only; and, fourth, they were firmer in their sockets and less sensitive

to pressure. I passed the hoes along the roots again, to assure myself that there was no more tartar remaining on them, and continued the treatment with iodine and the astringent wash. I further ordered him to press the gums with his fingers, commencing at a point over the roots as high as the attachment of the buccal muscles would let him, and pressing toward the crown of the tooth, but not over the margins. By this means, when I last saw him, he had reduced the exposed part of the root about two lines: he was discharged in six weeks, cured.

There was one case that puzzled me very much. The upper front teeth including the canines and first biscuspids, were very sensitive to pressure, yet there was no tartar on the roots, the gums had not receded, and, with the exception of a slightly deeper hue, were normal in appearance; neither was there any caries of the teeth; yet they were not as firm as they should have been, but their lack of firmness was not by any means remarkable. Counter-irritants and bleeding of the gums failed to give him any permanent relief, and it was not until a very serious nasal catarrh, with which the gentleman had been affected, had been cured, that the abnormal sensitiveness of the teeth disappeared, and they became again useful and comfortable organs. In this case the disease was not in the mouth at all, it was merely the extension of the irritation, caused by the catarrh, from the floor of the nose to the dome of the sockets, and serves to show that when the dentist can not find the disease in the mouth, or dental organs proper, he must look beyond, to the contiguous parts. And this proves, that for a dentist to be thoroughly qualified to practice his profession, he should have a much more thorough medical training than is usually given him, or he thinks necessary. But I will pass on to other cases.

A Mr D——, 22 years of age, from Acapulco, presented himself to me last November. The appearance of his face showed at once the ravages of a dental fistula. The history of his case was this: Six months previously he was at-

tacked with a severe throbbing pain, and great swelling in the region of the angle of the left inferior maxilla. A quantity of pus gathered, which at last found exit, externally by an opening in the cheek, a half inch over the notch of the facial artery. Being of a scorbutic diathesis, his physician treated him for scrofula, and it was not until the end of of the six months, when the discharge continuing obstinate, and the patient getting no better, that he commenced to suspect a slightly decayed second molar as the cause of the mischief, and ordered him to San Francisco to consult a dentist. Upon an examination, I found the cause of the trouble to be nothing but a retained wisdom tooth, one of the posterious knobs of which had only pierced the gum. The anterior knobs had evidently, in the process of growth upward, caught in the neck of the second molar, while the roots were held in the angle of the maxilla. The face showed a great depression in the region of the fistulous opening and a prominent tumefaction immediately over it. I extracted the tooth, and in doing so brought out a great deal of very fœtid pus, full of broken-down particles of necrosed bone. On probing the wound made by the extraction, I was astonished at the great destruction that had occured in the bony formation of the jaw. I do not think there was over half an inch in depth of healthy bone left in the angle. After scraping off the exposed surface of bone in the wound, and detaching little pieces that were sticking to the fleshy walls, and rinsing the part well with water, I bathed the cavity with carbolic acid and iodine, and introduced a pleget of charpie, saturated with these agents, to the bottom of the excavation, to prevent the closing of the wound and force the granulations to rise from the bottom. The discharge through the face ceased almost synchronously with the extraction of the tooth, and the part quickly healed up. I then advised rubbing and working the tissues of the depressed portion of the face, so as to thicken the integuments. And, in the course of a few weeks, I had the satisfaction of seeing the depressed portions fill out nearly to

the condition of the opposite side of the face, the tumefactions subside, and the wound fill up with healthy granulations to within a quarter of an inch of the surface, when his stay here being no longer necessary, he departed for his home in Mexico.

Another case is that of a lady, where, in consequence of the necrosis of a superior lateral, a destruction of bone had occurred, extending from the external surface of the superior maxilla to its palatial face, involving the antrum highmorianum. Bad as the tooth was, it yet acted as a tent-pole to the gum ; and its extraction would have produced a fearful deformity, that might defy the skill of a plate-worker to remedy. I set immediately to work to cure the root, and then, making a free crucial incision over the apex of the tooth, scraped off all extraneous and diseased matter. I then injected as in the previous case, carbolic acid and iodine, and occasionally a strong solution of chlor. of zinc, and kept open the wound by a pleget of charpie. Finding a month ago that there was no pus discharged, and the appearance of the mouth was that of health, I caused the injection to be simply of water, three times a day, a little salt being occasionally added to the liquid. I believe that in the course of time all the destroyed space will be restored by healthy tissue.

In the case of a Mrs. B., I cured an obstinate root of ulceration that I had treated with failure by the usual methods, by applying through the canal of the root, sulphuric acid, by means of a little cotton on a fine gold wire, and after the acid had its effect, neutralizing it with liq. ammonia, applied likewise with cotton. Two applications had the desired effect, and now, at the end of eight months, I find the tooth, to all appearances, in as good condition as if it had never been guilty of an ulceration.

Three months ago a Mr. P. came to me with a highly sensitive first left superior molar. The attrition consequent on mastication had worn off the enamel over several points in the grinding surface, the internal or lingual root was ex-

posed over one half of its length, by the recession of the gum in consequence of a disease of the alveolus, occasioned by the presence of tartar, and all these parts, that were denuded of enamel and of gum, were exquisitely sensitive, not only to cold and heat, but to contact with food and the air of respiration. The tooth had been suffering from this exalted sensibility for some time, and had become at last so painful as to be unendurable. The gentleman had already lost the central and the corresponding molar of the opposite side, from this same cause—the different dentists to whom he had applied knowing of no better cure than extraction. I applied the granulated chloride of zinc to the sensitive parts, allowing it to deliquese with the moisture of the breath, in order to impress the parts with its full strength; but, notwithstanding the repeated applications of this salt, the tooth continued as sensitive as ever. I tried counter irritants, imagining the unusual sensibility due to internal irritation, but without the desired effect. At last, I drilled a cavity in the tooth, and put the arsenious application in common use. This was effectual. I then drilled further, devitalized the pulp, extracted it, and filled the tooth, which has been comfortable ever since; the only trouble now remaining being the diseased alveolus, mentioned before, and which is now about cured.

I hope at the next meeting to be able to report the successful termination of a case, that I have already commenced treating, the particular interest of which is due to the vastness of the lesions, it involving nearly the whole of the left superior maxillary and contiguous parts.

A freak of dentition has just come to my notice, showing the complete independence of the permanent from the deciduous teeth. A child that had never had the four superior temporary incisors, at the eighth year commenced cutting the corresponding permanent ones, and has them now in the proper place, well formed and regular.

ARTICLE III.

Report of the Committee on Microscopy.

BY S. P. CUTLER, M. D., D. D. S., CHAIRMAN, MEMPHIS, TENN.

Read before the Tennessee Dental Association, October, 1873.

Microscopy of a left lower molar of a stout, healthy farmer, bilious temperament, 36 years of age. This tooth has some unusual descriptive and microscopic features connected with its history. This tooth is well formed and developed, the points of the fangs are completely ossified, they naturally coming in contact; this ossification belongs to the cementum only, not involving the dentine. The tooth has a cavity on ante. prox. aspect, not extending to pulp cavity, though near it; had been troublesome for some time.

On extraction, (which was a difficult process,) there came away with the tooth all the bone included between the fangs, as the fangs could not yield. On inspection I found this included bone quite firmly attached to fangs.

I made a microscopic section by sawing through the centre longitudinally up to the enamel, including fragment of bone. On holding this prepared specimen to the light, and looking through, it presents on one side or one fang in places not continuous, that peculiar ligaline or horny appearance so often witnesesd in teeth of old persons, and sometimes in younger: hence, diminished vital resistance and ossific encroachments in consequence follow.

Under the microscope this specimen has some unusual features not seen before by your committee. There are normal tubuli and occluded, or nearly so, tubuli in the hyaline structure ; also secondary dentine to a considerable extent, the pulp cavity being greatly narrowed, presenting the tortuous irregular tubular structure so often witnessed in the class of teeth above named.

The included fragment of alveolus presents the most unusual and remarkable features ever witnessed by your committee ; in some places this fragment of bone has the normal microscopic structures, *i. e.*, *lacunæ* and *canaliculi*, in other

places the *lacunæ* and *canaliculi* present that appearance pertaining to extreme age, an obliteration to a great extent of *canaliculi* and inclosing of the *lacunæ*. In other regions, there are none of the microscopic bone structure, but instead there are the original cartillaginous stores of cells not having been differentiated in the slightest degree towards bone structures; there are the nice shaped smooth and perfect cartilage cells just the same as witnessed in all true original bone cartilage and in other cartilage, which vary somewhat. This portion of the fragment of bone appears to be just as firm and hard as the balance of the bone; it also has the usual Haversian canals through it. There is no cementasis of any portion of the fang as might have been expected in a tooth with so many peculiarities.

The question in this connection is, how is it possible for cartilage to become hardened with lime salts without the normal bone structures; and how the lime salts could work their way through the cartilaginous structure so as to completely harden the bone, though not properly ossified, as that term means true bone formation? The process must have been osmosis, as there are no apparent communications from one cartilage cell to another cell.

This may not be new to all, though it is to your committee. May we not expect to find still other anomalies in our special department.

ARTICLE IV.

The American Academy of Dental Science.

The sixth annual meeting of the American Academy of Dental Science was held September 29th, in Wesleyan Hall, Bromfield Street, Boston.

Dr. Daniel Harwood presided. The forenoon was devoted to a business meeting, at which the various annual reports were read and new members elected.

Dr. Harwood, having served the Academy faithfully and acceptably as their President during the past five years, de-

clined a re-election to that position, and the following gentlemen were elected officers for the ensuing year.

President.—Joshua Tucker, M. D.

Vice President.—Luther D. Shepard, D. D. S.

Corresponding Secretary.—Edward N. Harris, D. D. S

Recording Secretary.—W. Lewis Tucker, D. M. D.

Treasurer.—George T. Moffatt, M. D., D. M. D.

Librarian.—John Clough, M. D.

Board of Censors.—Elisha G. Tucker, M. D. Jacob L. Williams, M. D. Willard W. Codman, M. D.

At 2 o'clock in the afternoon the Academy listened to the annual address, prepared by Prof. P. H. Austen, of Baltimore, who having been prevented from attending the meeting by sickness, his address was read by Dr. L. D. Shepard, of Boston. The subject was, "Is Dentistry a Liberal Profession?" and it was treated in the well known able and scientific manner of the author.

The thanks of the Academy were presented to Prof. Austen, and a copy of the address was requested for publication.

Interesting papers were read by Dr. Norman W. Kingsley, of New York, upon "What Decided You to Become a Dentist?" Dr. Asa Hill of Norwalk, Conn., upon "The Progress made in Dental Art during the thirty-five years that he had been in Practice." Dr, John T. Codman, of Boston, upon "The Best Way to spend a Vacation.

At 5 o'clock the members and other invited guests sat down to their sixth anniversary dinner at the Parker House.

E. N. Harris, D. D. S.,
Corresponding Secretary.

Boston, Nov. 17th, 1873.

ARTICLE V.

Cleansing and Smoothing Palatine Surface of Rubber Plates.

BY B. M. WILKERSON, M. D., D. D. S.

After removing a rubber plate from the flask, it is to be cleaned, which can be much facilitated by using a small

wire brush. All the plaster and roughness can be readily removed from the palatine surface where it is difficult to reach with any other instrument. The brush should be made of very fine brass wires, bound together with a stout wire, (like the file cleaner,) in a bundle not exceeding an eighth of an inch in diameter. This is a convenient instrument in the laboratory for other purposes, and a trial will ensure its use.

SELECTED ARTICLES.

ARTICLE VI.

Diseases of the Antrum.

BY A. VANS BEST, M. D., F. R. C. S.

The diseases of the cavity of the antrum proper must be kept, in the surgical description and treatment, separate from those which have their rise in the alveolar process—such as epulis or ostitis—terminating in necrosis, &c. The diagnosis of disease in the interior of the antrum is, at first, very difficult, and the symptoms about to be described fail to point out, with certainty, with what disease the surgeon has to contend.

In the first place, pain, a feeling of weight, and "neuralgia" are complained of, and a slight puffiness of the cheek is observed. The nostril on the side effected is generally dry, and on examining the mouth there will usually be found disease of the bicuspid teeth, with, probably, necrosis of the root of one of them, which may or may not have found its way into the antrum. Under these circumstances I have

never seen any enlargement of the antrum, although the cheek is usually puffed. The proper treatment, of course, is to extract the dead portion of the tooth, make a free opening with the trocar, and wash out the cavity with some weak disinfecting solution. Should it be impossible to ascertain, in a mouth filled with stumps, which is most to blame, I prefer passing a full-sized flat trocar above the root of the second bicuspid.

A second class of cases occurs in which we have dropsy, or pseudo-dropsy of the antrum—in my experience always associated with non-malignant polypus, exactly similar to the fibroid polypus of the nose. In these cases little pain is felt, and the only uneasiness complained of is a feeling of stuffiness in the head, weight in the affected part, and lachrymation from the eye of the side affected. Should the opening from the antrum into the nose be closed, the pressure from the accumulated fluid soon thins the anterior wall, and the cheek, on being pressed upon, gives a most characteristic crackling sensation. The face being swollen, it is generally then that people of the middle and lower classes first apply for advice. In cases such as these there is no necessity for the removal of the antrum; the proper treatment I consider to be to divide, if necessary, the upper lip, tying the coronary arteries, pulling up the flap, and with a strong scalpel, dividing and removing the whole of the attenuated bone. Probably a considerable amount of serum will escape, and most likely a polypus will be found in the cavity. The only risk attending this operation is hæmorrhage from a wide-based polypus, and this is easily controlled by the actual cautery, or plugging with a strip of lint dipped in perchloride of iron with glycerine.

Osteo-sarcoma and enchondroma of the upper jaw require complete ablation. There is no difficulty in the diagnosis, as the tumor is firmer than scirrhus, rough and irregular in outline, and slow of growth. On opening the front part of the antrum, should the tumor be found to present the character of encephaloma, it would be worse than useless to at-

tempt to extract it, as it would certainly recur from the numerous processes extending toward the back of the orbit and base of the skull.

In schirrhus, however, it appears to be different. The diagnostic points of schirrus of the antrum I think may be described as follows:—Hereditary predisposition; advanced age; constant dull pain in the part, with occasional stabbing pain; the speedy appearance of a swelling in the cheek and palate, which may in time be also felt with the finger at the posterior nares; and, as the disease advances, the eye may be extruded. Excessive pain generally prevents the sufferer from sleeping, and this is the principal reason that would lead the surgeon to remove the superior maxilla—not so much to cure the disease as to give comfort to the patient and to prolong a life which would certainly speedily come to a close from the wearing suffering the disease entails. The operation, however, of the removal of the whole antrum is generally held to be unjustifiable should any enlargement of the submaxillary glands exist, still more so should any head symptoms show that processes of the tumor extend towards the base of the brain.

Cases of abscess of the antrum treated by perforation, and completed by cure, are far from uncommon. Fibrous tumor of the antrum I have twice removed by cutting through the attenuated bone with a strong scalpel, and stopping the hæmorrhage with a long strip of lint firmly plugged in the cavity; in neither of those cases did I divide the lip.

Tho entire removal of the right superior maxilla, together with the pterygoid process and palate bone, is a much more serious affair, both for the patient and the surgeon, and I am glad to place on record an instance of its successful performance.

Mrs. R——, aged sixty-three, sanguine and healthy-looking, had from the month of May, 1872, pain in the right antrum, which gradually increased in severity during three months. She thought it was rheumatic. No swelling appeared till the end of June, when she became sleepless

night, and a dull aching pain lasted all day. She had lost all her teeth on that side, with one exception, and that was removed without benefit. I first saw this case about the beginning of July, when there was fullness of cheek, and a lobulated expansion of the hard palate, of the right side; and a tolerably hard tumor could be felt at the back of the posterior nares; great persistent pain was complained of; there were no enlarged glands. An exploratory puncture was made by her usual medical attendant, with a negative result. I subsequently say her, arranged matters, and at her urgent desire, operated on Saturday, September 21st.

The patient being supported in a chair, with a sheet tied round her, chloroform was gradually administered. I divided the upper lip into the right nostril; tied the coronary arteries; entered my scalpal over the right malar bone, cutting to the bone, across to the nasal process of the superior maxilla, then down the side of the nose, round the ala, to join the first incision. I quickly reflected the whole flap, holding it firmly to compress the vessels, and dissecting free of a nodule of tumor prominent in the anterior wall. I then tied what vessels bled; cut with a cutting pliers the malar bone above and below, completing the section, as also the external orbital angle and the nasal, and the internal angle of the orbit, with a Liston's forceps. With a pruning-claw nippers, the hard palate was easily divided. After separating the eye from the orbital plate, I found the lion forceps would break up the tumor; so I used a long flat-bladed lithotomy forceps, placing one blade in the orbit, and dividing the pterygoids and other attachments, succeeded in wrenching the whole mass away. Immediately on its removal, a very large jet of blood sprang from the deepest corner of the wound; this was immediately controlled by the finger, and arrested by two applications of the actual cautery. This probably was the internal maxillary greatly enlarged; but its situation was so deep at the tip of the petrous portion of the temporal and body of the sphenoid bone, that it is impossible to be sure of the vessel. A few parts of the soft

palate and cheek required a little trimming, and several small vessels were ligatured; long strips of lint damped with tincture of muriate of iron were pressed to the very base of the skull, and the wound united with gold wire sutures, except the free mucous membrane of the lip, which was stitched.

The patient soon rallied, and slept almost continuously for two days, being only wakened to have her mouth syringed and to get milk, beef tea, and ice. On the third day all the strips of lint were removed, without any hæmorrhage; the greatest attention was paid to syringing the whole wound with diluted Condy's fluid, and at times, carbolic acid lotion. Five weeks after the operation all the external wound was healed, with the exception of two small holes in the transverse incision; and the patient returned home quite relieved of all her former suffering, and with a fair chance of life being prolonged for some years.

In doing this operation again, I would not cut quite so close to the orbit, as the tissues are not very vital there. There was no sloughing, but, notwithstanding a free allowance of port wine, bark and whisky, these portions would not unite by the first intention.

The tumor presents the following appearance:—It is of the size, and somewhat of the shape of a large lemon. Below half the palate; posteriorly, the mucous membrane of the posterior nares and pharynx; internally, the turbinated bones; externally and laterally, a long tongue that has extended into the spheno maxillary fossa; anteriorly, a rounded protrusion through the wall; superiorly, the orbital plate. It is quite solid after immersion in spirits; and microscopically, is an admirable example of fibrous schirrhus.

The patient can speak wonderfully well, sleeps, eats soft food, and is in every way comfortable. She left for her home within six weeks of the operation.

I was most ably assisted by Dr. A. Forbes; Dr. Scott, of H. M's Navy; Mr. Moir, the house surgeon of the Royal Infirmary, Aberdeen; and Dr. Inglis, who most judiciously

kept the patient sufficiently under chloroform. There was no trouble from blood getting into the larynx.—*London Lancet.*

ARTICLE VII.

Pathological Dentition.

BY JAMES W. WHITE, M. D.

Dentition, though a physiological process, is nevertheless recognized as a frequent cause of constitutional disturbance. Doubtless there are extremists who overestimate the average influence of this process as a disturbing element, as there are those who underrate the difficulties which may attend it. Pathological dentition is by many considered a secondary affection,—a single link in a chain of deranged actions,—and, even when a little patient indicates unmistakably the local irritation, relief is sought by general medication,—relaxants, derivatives, calmatives, febrifuges, etc.; then by local emollients, fomentations and anodynes; and lastly, if at all, by lancing the gums, when redness, tumefaction, induration, or the whiteness of the coming tooth seems to demand it. These signs are indeed assumed to be the only possible justification of the operation. If the gums are tumid, tense, and shining, swollen up into a kind of little tumor over a particular tooth; if an unhealthy ulceration with a sloughy appearance forms upon the summit of the gum; then, say our text-books and writers upon the diseases of infancy,—*then* we may sometimes resort to incision of the gum.

"In forming a diagnosis," says one of the highest authorities, "whether a disease present during the time of teething is consequent upon some derangement of this process, or upon an abnormal condition of some other organ or organs of which the dental difficulty is but itself a symptom, the state of the jaws must be the principal guide. If in the presence of symptoms which might arise from teething, we

find that the teeth are not pressing forward towards the surface of the gums, and that the latter maintain their normal appearance, it will be useless to have recourse to the gum lancet." Young practitioners are cautioned, by a recent writer, not to display their ignorance by the use of the lancet, except the *local* indications imperatively demand it. The local signs, it is to be inferred, are tumefaction, redness, induration, ulceration, and the whiteness of the presenting tooth. The direct pressure upon the fibrous tissue is thus assumed to be the cause of the various and serious complications which are too frequently associated with the period of the primary dentition. It is doubtless true that a hyperæmic condition of the gums may be caused by the growth or eruption of the teeth proceeding more rapidly than does the absorption of their tegumental covering, and that the undue pressure thus caused may occasion trouble, by the irritation of the nerves of the gum tissues,—manifested locally by tumefaction, soreness, redness, or ulceration; systematically, by fever, irritability, sleeplessness, etc. It is also admitted that judicious treatment of pathological dentition should in all cases include hygienic care, and that constitutional medical, as well as local surgical, interference is generally demanded. Nor is it claimed that in the perversion of this physiological process is to be found an explanation of all the ills to which human infancy is heir; but we assume that pain so intense and unremitting as to destroy the appetite for food, to cause wakefulness, irritability, thirst, fever, diarrhœa or constipation, congestion, convulsions, and death, may be due to the irritation of dentition *without the existence of a single local indicatian.* In other words, that the most serious complications of dentition are not caused by the pressure of the advancing tooth upon the gums, but by the backward pressure of the resisting gums upon the developing and sensitive *pulp*, giving rise to a true toothache, comparable only to that exquisite torture which is experienced in after-life from an exposed and irritated plup.

If such a condition of things is possible, it will readily be seen that there can be no question as to the extent of the mischief which may result. The association of the fifth pair of nerves, which supplies the dental filaments, with the great sympathetic so connects the teeth with the entire economy that the pathological bearings of such deranged action may not be limited. That such a condition may exist will be readily understood, if it is remembered that at the period of eruption the roots of the teeth are as yet incomplete; that instead of the conical termination and minute foramen which characterize perfected teeth, the aperture is quite large, and its edges thin and sharp. In estimating, therefore, the amount of constitutional disturbance which may result because of a want of accordance between the eruption of a tooth and the absorption of the superimposed tissues which impede it, we may imagine the sensitive pulp, made up of arteries' veins, and nerves, in a condition of irritation from augmented vascular and nervous action,—a morbid activity of the process of dentition,—followed by determination, stasis, and congestion producing a hyperæmia sufficient to cause the protrusion of the mass from the in. complete aperture of the root; which, being impressed upon by its thin, sharp edges, is sufficient cause for any amount of constitutional disturbance of which it is possible to conceive.

Under such circumstances it is not difficult to comprehend the inefficacy of any or all hygienic measures; of relaxants and febrifuges; of local emollients and anodynes. It is also easy to understand how the thorough lancing of the gums, over the tooth or teeth thus situated, may, by removal of the pressure, give a relief so immediate and complete that there shall be no room for doubt as to the correctness of the diagnosis.

The *general* indications of what may not inaptly be termed infantile odontalgia are precisely what might *a priori* be expected. The child, at first simply uneasy, becomes by rapid stages fretful, troublesome, peevish, cross, vindic-

tive; cries persistently, or stops crying only to scream; or, if quiet for an instant, will be found to have its thumb or fingers thrust between the jaws, the chewing upon which seems to afford a momentary cessation of anguish, but only momentary. It refuses food, throws down its toys if handed to it, as though in a passion, and is outraged by any attempt to amuse it. To these persistent unmistakable evidences of irritability are added a flushed face, corrugated brow, compressed lip, intolerance of light, and disturbed, broken sleep, the desire and effort to sleep seeming to be thwarted by fresh accessions of pain, until the little one sinks exhausted into a troubled slumber, but of short duration. Concomitant with these manifestations, or quickly succeeding them, will be some of the various systemic complications, too frequently with fatal ending, and still *no local indication* of the trouble which is consuming the young life.

A case recently under the care of the writer afforded a marked confirmation of these views. A child one year of age, with the four superior and two inferior incisors in position, after three weeks of restlessness, wakefulness, loss of appetite, fever, paroxysms of pain, and rapid emaciation,—all without obvious cause, certainly without the slightest local indications of trouble in the mouth,—was *cured* by free crucial incisions over the molar teeth, the improvement being so evidently the result of the operation that the relation of cause and effect was plainly recognized by every member of the family.

Such cases are not exceptional, and suggest a more careful investigation of the developmental processes of dentition in otherwise unexplainable diseases of infancy.—*Medical Times.*

ARTICLE VIII.

Case of Facial Paralysis.

BY GOUVERNEUR M. SMITH, M. D.

The brief recital of a case of Bell's paralysis, which has recently come under my care, may prove of interest, as the method of treatment adopted tends to show the correctness

of views originally presented to this Academy a short time since by one of its distinguished fellows.

On the 5th of April last, a patient came under my care, suffering with paralysis of the left side of the face. The patient was a gentlemen of culture and means, about sixty years of age. Residing for a large part of the year at his country seat, on the Hudson, and spending much of the time in the open air, he was ordinarily in the enjoyment of excellent health, and manifested his robust condition by a commanding appearance. The occurrence of such local palsy was the occasion of no little solicitude in the mind of the patient, lest it be precursory of a hemiplegic seizure.

In studying the etiology of the malady, it seemed probable that the disorder had been excited by cold, to which the patient had been exposed while riding in the Central Park on the day previous to the one upon which the paralysis was fairly developed. There was no evidence of centric disturbance; peripheral lesion was not marked by any decided local point of irritation.

In speaking of peripheral facial hemiplegia, Atken remarks: "Although it is not a dangerous form of paralysis, it is one from which recovery is very slow, and in which prognosis, as to complete reeovery of symmetry of the face, is uncertain." And also says, "from four to ten months is the ordinary duration of the affection; but there are instances in which the paralysis yields in twenty-four, fifteen, or even twelve hours, but such cases are exceptional." (Trossean.)

After regulating the bowels of my patient, he was placed under the use of iodide of potassium, and on four occasions electrization by a specialist was applied to the affected side. No counter-irritation behind the ear was resorted to, owing to the absence of apparent local lesion. On the 21st of April the patient had shown little or no improvement. I remembered that Dr. William Detmold had read a paper before this Academy (March 20th, 1873,) entitled "Facial Paralysis treated by a New Nethod." Not having been

present at the reading of the paper, I called upon Dr. Detmold, and he briefly gave me the views he had here expressed, and as since published in the *New York Medical Journal*, May, 1873.

In the case which he has reported he says: "I determined to try what mechanical means would do. I bent a wire into a hook, which I put into the drooping corner of the mouth, and, drawing it up, bent the wire over and behind the ear. I recommended the patient to keep it on over night, trusting that by entirely relaxing the paralyzed muscles, and supporting the dragging weight, I might somewhat relieve the defect." Prompt amelioration followed this method of treatment. Dr. Detmold further says: "It then occurred to me that I might make this instrument still more effective, if I could combine with it a permanent and continuous galvanic current through the paralyzed parts, by having it made of two different metals, thus forming as it were a single cell of a galvanic battery." An instrument fulfilling such purpose was made by Mr. Chester under Dr. Detmold's direction, and the patient at the time of the report was steadily improving. The case had been a chronic one, of sixteen years' duration, and had not before been relieved. In this conclusion Dr. Detmold remarks: "I am unable to say what share in the benefit, or whether any is due to the galvanic current, to which, on the whole, I do not attach as much importance as to the mechanical support."

Resolving to test the applicability of this method of treatment to the acute case under my care, I procured from Mr. Stohmann's a German silver wire mouth piece, used by the dentists in holding the mouth open during dental operations. The dentists employ two, one on each side. One of these I bent in such a manner that it would not keep the mouth open, but simply act as a hook comfortably catching the corner of the mouth, and to the outer end fastened a piece of copper wire, which passing across the cheek, was turned around the ear. The wire passing over the ear being covered

with a soft material, was not a source of irritation. As the cheek was quite pendulous. I ordered a bandage to be passed around the head under the jaw, to give additional support.

The relief which followed was significant, for after using this appliance for two nights, decided amelioration was manifest. Wishing the patient to avail himself of any advantage that might be derived from the galvanic current, I went with him to Mr. Charles T. Chester's, 104 Centre Street, and giving a wire model as to size, Mr. Chester had prepared this neat instrument, which is a fac simile in principle of the one made under Dr. Detmold's direction. The smooth and easily fitting hook or mouth-piece is made of platinum, the wire running across the cheek and turning behind the ear is of silver, and to this is adapted a zinc plate, which is covered with velvet, with the view of readily retaining the moisture of either saline, acidulated, or pure water.

The patient on procuring this instrument substituted it for the one I had extemporized, using it at night; convalescence was rapid. Recovery from the facial paralysis was complete in about a month from the time of its incipiency. There has been no recurrence of the difficulty; the symmetry of the face is normal.

Several questions naturally arise in this connection. In the first place, was this case one of those occasionally met with, in which recovery takes place without material artificial assistance; and, in the second place, if recovery is due to treatment, how far was it attributable to the mechanical means, and how far to galvanism? In response I would say that there was scarcely any perceptible improvement in the patient until the "mechanical means" were resorted to; convalescence seemed to date from the night they were employed.

Whether or not the second instrument was a more potent remedial factor, by its galvanic properties, it is difficult to say. The patient was not conscious of any galvanic influence, though there is no question of the passage of a current

through the affected side, by means of this appliance, but as stated in Dr. Detmold's paper, from the periphery to the centre. In regard to the action of this instrument, Mr. Chester has written to me as follows: "I have tested the little galvanic battery, made to apply to the face of Mr. ———, in a general way. The covering of the zinc plate, being moistened with water, made a good conductor by the addition of a slight trace of acid, and the plate then applied to (behind) the ear, while the platinum end was inserted in the mouth, I find that it generates a steady current capable of deflecting a galvanometer or sending a telegraph message easily through seventy-five miles of the ordinary telegraph wire."

This case, so far as I am aware, is the first acute one treated by the method suggested by the distinguished fellow to whom allusion has been made.—*N. Y. Med. Journal.*

ARTICLE IX.

The Laws of Transmission of Resemblance from Parents to their Children.

BY JOHN STOCKTONHOUGH, M. D.

The fact of males resembling their mothers and maternal grandfathers, and females their fathers and paternal grandmothers, was well known to most ancient philosophers and physicians, and many were the reasons given for this condition of resemblances, though none seem to have gone beyond atavism, until in the present day reversion has taken its place. All terms hitherto used as expressive of this condition are without meaning in regard to the proximate cause. The writer will give below what he considers to be the proximate cause, knowing of no other satisfactory explanation as having been given, and offering this as original.

Males are begotten from nature ovules (eggs,) and females from immature ovules, hence the *ovule* from which a male is derived is (for a certain length of time, probably from

three to seven days) *longer under the sole influence of the mother* than the ovule from which a female is derived, and as the period beginning fecundation and ending with the extrusion of the ovum from the Graafian follicle is claimed by some as that in which reseemblance and hereditary predisposition are impressed, we are led to believe that the sexual differentiation in the resemblance of sons and daughters to their parents is principally due to the difference in the time in which the ovule is under the sole influence of the mother, modified, perhaps, in some degree by the dynamic difference in the ability of the male element to fecundate a mature or an immature ovule, the latter being the more difficult. This, then, appears to be the cause of the embryo, and variations in the condition of the mother during gestation.

Recapitulation :—

1. In general, children of both sexes resemble their mother more than their father in physiognomy, habits, constitution, and temperament.

2. Usually boys resemble their mother more than their father in physiognomy, habits, constitution, and temperament. In the same relationship girls resemble their father more than their mother.

3. As to whether there is any constant relationship between the physiognomical resemblance and a predisposition to the diseases of the person resembled, it is very difficult to decide from the data at hand, but it would appear from the new facts in which any observations were made in this direction, that there was a larger percentage of cases in which inherited diseases were exhibited where there was no resemblance than where there was such physiognomical similitude. In other words, children have resembled one parent in general physiognomy, while they have inherited the constitutional peculiarities and diseases of the other, more frequently than where they have derived both these conditions from (one) the same parent.

This view of the matter is supported by the following cases already recited in this article:—

Mr. Sedgwick's case of icthyosis, where a girl inherited "the disease from her mother," while "she inherited the features of her father."

Dr. Moreau asserts that personal resemblances and cerebral disorder may be transmitted by either parent, but never by the same.

Dr. James Webster assures us that insanity is more frequently transmitted by mothers to their female offspring than to their male children. And Dr. Theophilus Thompson has shown the same fact to be true of the transmission of pulmonary consumption.

The facts are too few to warrant us in defining this as a law, yet I know of no facts of theories to the contrary. I am under the impression, however, that physicians have usually regarded a physiognomical resemblance as evidence of greater liability to the hereditary disease of the person resembled, yet it is quite possible I may be mistaken in this view of the matter.

In general, then, hereditary and acquired diseases and defects are more likely to be transmitted to offspring of the sex in which they originated, and thereafter to be subject to the principle of sexual limitation either directly from parent to child, or by interrupted or atavic descent, from grandparent to grandchild.

Though sons are usually best able to follow the avocacation of their fathers, it is undoubtedly true that men inherit the genius, talent, and intellectual excellence and mortality of their mother or their mother's father, while daughters inherit the same qualities from their father or paternal grandmother.

Females more frequently transmit hereditary diseases and defects than males, though they *less frequently exhibit* them. Males less frequently transmit, and more frequently exhibit, inherited diseases and defects.

I have already, in my last paper called attention to, and offered an explanation of, the phenomena stated in the last conclusion (4), and may repeat it here:—

The ovule (egg) from which a male is derived being for a longer time under the sole influences of the mother (before fecundation, and longer in utero-gestation) than the egg from which a female is derived, acquires more of her physical constitution and peculiarities, resembles her more, or inherits more of her physical defects and tendencies, and this ovule is fecundated by a weaker element on the father's part than his female offspring; while the ovule (egg) from which a female is derived is a shorter time under the sole influence of the mother, being impregnated earlier in its course of development (being less mature,) and besides this it requires the highest power of the male element to communicate the impregnating influence to it. Hence we have less hereditary disease *exhibited* in the female, yet she may *transmit* with greater frequency and facility than the male, though it may not have developed in her.

The reason that females do not exhibit hereditary disease as frequently as males, is because of a *higher degree of vitality* in them, which gives them greater power to restrain the appearance of the predisposition, and an *inferior degree of developmental evolution*, retaining in their constitution as germs, what in men become fully developed diseases and defects.—*Medical Recorder*.

ARTICLE X.

Hereditary Syphilis.

I saw, in Prof. Jones's office, a skeleton of a female who died of hereditary syphilis. I will copy Dr. Jones's description of the case, as it appears in his pamphlet entitled *Clinical Memoranda:*

" I examined this unfortunate woman in the Charity Hospital only a day or two before her death. At the time of my observation she appeared to be exceedingly feeble, and was a mass of offensive running sores. I obtained the body after death, and had the skeleton carefully prepared. The

hymen was perfect, and the disease appeared to have been derived from inheritance, and to have manifested itself from early childhood. The feet was very small, not much larger than those of a child four years old, and appear never to have been used in walking. All the long bones of the body were more or less carious, and, in almost every case, were punctured or ulcerated through, at one or more places. The pelvic bones were carious, and the os sacrum was a mere shell. The vertebræ, were all carious. The upper jaw contained one small tooth, and the lower jaw three teeth. The alveola were absorbed. The outer and inner tables of the skull were perforated in several different places. The lower jaw, on the right side, was eroded through. The position of those fractures and erosions were marked during life, by open running sores.

"It is impossible with the pen, to portray, adequately, the terrible condition of this unfortunate female, whose bones literally rotted, piecemeal by piecemeal, during life. And the best description which we can give of the skeleton is, to say the bones of the feet, ankle, os calis, were carious; the tibia and fibula, the femur, the pelvic bones, the os sacrum' the radius, ulna, the humerus, the scapulæ and sacrum, the lower jaw and cranium, were all eroded through in various places."

This case I regard as one of the most remarkable on record, and has been very accurately described by Professor Jones; it clearly shows the tendency of constitutional syphilis to undermine and break down the constitution, sooner or later, if not eradicated from the organism, which may be possible at a given stage, notwithstanding the immense weight of testimony to the contrary.

We discover, in this case, the great tendency of this disease to locate itself in the bones, from some strong affinity the lime of the bones has for the specific virus, which, we naturally conclude, is of an acid character. Notwithstanding it is ascertained that the disease produces a profound change in every cell and corpuscle of every tissue of the

body, until it is permanently seated in the bones; there may be some chance for permanent eradication, if properly understood and treated in time.

One striking peculiarity I will mention in relation to this case. The three teeth in the lower jaw, the left cuspid and the right central and lateral incisors, are large, and well developed in every respect; though the alveolæ is extensively absorbed, the teeth are firm in the bones. There are no grooves, pits, or notches, as might have been predicted. These teeth are the only exception to the ravages of the disease. The upper tooth I did not see. There are no evidences in the jaw bones of her ever having had any more teeth, though it is presumable that she did, and that she lost them by alveolar absorption, as the three teeth show no evidence of decay. The mouth, at least during the period of second dentition, must have been comparatively healthy, and free from the disease, from the indications of the three teeth.

In the Museum of the Medical Department of the University of Louisiana, Professor Joseph Jones has a collection of skeletons, implements of warfare, images, vases of religious worship, besides cooking utensils of various kinds, from the Mounds of Middle Tennessee. These are the remains of the mound-builders, whose history, with their barbarous civilization, is entirely lost; conjecture alone remains. I noticed about a dozen skulls, and most of the other bones belonging to them.

In that collection of bones, I notice evident signs of constitutional syphilis, either hereditary or induced—most likely the former. There were nine tibia, and five fibula, showing unmistakable evidence of the disease; the spines of the tibia were quite extensively corroded, mostly the entire length.

I did not find any evidence of the disease about the skulls; the teeth, in particular, were perfectly natural and sound—no furrowing or pitting of enamel, which is sometimes noticed in hereditary disease, or even induced during infancy.

These facts show conclusively that syphilis is not altogether a creature of civilization.

Another curious case of furrowed enamel was that of a lad about 14 years old, who said he had the measles when five or six years old, and was not expected to live for a long time. The two upper central incisors were grooved across, near their cutting edges or points. The four six-year molars were similarly grooved all around the borders of the grinding surfaces, with sharp points projecting up at each cusp. The father and elder brother, also the lad himself, stated that the grooving was up close to the gums after the teeth were fully grown, and that the grooving continued to grow off, or towards their points, and was perceptible from year to year.

The teeth were all well developed, and sound.—*Prof. Cutler on Furrowed Enamel.—Nashville Journal of Med. and Surgery.*

ARTICLE XI.

Carbolic Acid as an Anæsthetic.

BY ANDREW H. SMITH, M. D.

Dr. Andrew H. Smith reported to the Medical Society of the County of New York, April 22d, 1872, some experiments made upon himself, which fully confirm the statement of Dr. J. H. Bill, as to the local anæsthetic power of carbolic acid.

"In my first experiment," says Dr. Smith, "I painted a spot on the forearm, about an inch in diameter, with carbolic acid of about the strength of 85 per cent. For about a minute there was a slight burning sensation after which the integument became entirely insensible, the cuticle being whitened and shriveled, and the spot slightly elevated. I then with a scalpel made an incision about half an inch in length through the whole thickness of the integument. This was done without even feeling the contact of the knife.

The capillary circulation seemed not to be materially interfered with, as the blood flowed as freely as it would from a similar wound under ordinary circumstances. The reparative process was also not impaired, cohesion taking place immediately. Three hours after the application of the acid a needle could be thrust freely into the skin without causing pain.

"In the second experiment carbolic acid was applied as before, and ten minutes after a fly-blister was placed upon the spot. The blister remained eight and a half hours without causing any pain, and without producing vesication.

"In two instances I have applied the acid previous to incising a whitlow. The operation was almost painless, but, as the whitlow was in each case of the superficial variety, the test was not entirely conclusive.

"Inhaled in the form of spray, I have found the acid very useful in allaying irritation of the bronchial mucous membrane; coughs which have resisted all ordinary treatment have been immediately relieved, and in the course of two or three days entirely removed.

"I would suggest the use of carbolic acid as a revulsive, in cases in which a continuous impression is desired. While causing but little suffering, it produces an intense hyperæmia of the skin, which persists for eight or ten days, and is followed by the desquamation of the cuticle."—*New York Medical Journal.*

ARTICLE XII.

The Theory of Counter-Irritation.

BY JAMES ROSS, M. D, MANCHESTER.

Counter-irritation was defined as the application of an irritant to one part of the body in order to influence morbid action in its vicinity. The theory advanced was that (1) the influence of the counter-irritant is conveyed by continuous and contiguous tissue, and not through the blood-

vessels and the nerves; and (2) the influence conveyed is always of a stimulant character. An endeavor was made to deduce the first position from the general theory of inflammation; and the author stated that the second assumption would account for all the effects which counter-irritants are known to produce in the treatment of various diseases. A stimulant action might aggravate the disease in the first stage of inflammation, and counter-irritants were known to produce this effect occasionally. At other times a stimulant action might in this stage assist the disease through its natural progress, by developing the second stage of inflammation. An instance of this effect occurred when the pain of pleurisy was relieved by a blister. In such a case the disease was not checked, but the effusion separated the pleuræ, and the pain was relieved. In the second stage of inflammation, and especially in chronic cases, a stimulant action was most likely to promote health, and it was in such cases that counter-irritants were most safely employed. A similar remark might be made with regard to cases of local debility, in the treatment of which counter-irritants were found useful. Quantitative differences were found to exist in the effects of counter-irritants according, first, to the proximity of the irritant to the seat of the primary disease, and, secondly, to the degree of the artificial irritation produced, and these differences were easily explicable on the supposition that the influence exerted by the counter-irritant upon the disease was of a stimulant nature.—*Medical and Surgical Reporter.*

EDITORIAL, ETC.

The Birthplace of Modern Dentistry.—In a recent publication entitled "The Monumental City," edited by G. W. Howard, we find the following:

"In one sense Dentistry is a modern science. That it was known and practiced in ancient Egypt, is evident from the discoveries in the Pyramids; and that a measure of skill was attained, is apparent from the remnants of workmanship still preserved, but its disappearance was as complete as the passing away of the Lost Arts, and in the eighteenth century practical Dentistry had no existence. During that period public attention was attracted to the subject, and a number of theoretical treatises were written by enthusiastic physicians. It was not however until the early part of the present century, that the views of its votaries assumed a practical direction sufficient to elevate it into a distinct science. America had the honor of nursing it through its infant struggles, and Baltimore may with propriety be called the birthplace of modern Dentistry.

"In 1826, the "Principles of Dental Surgery" appeared in London, a work written by Leonard Koecker, a Baltimore physician. This was followed, in 1839, by the establishment in Baltimore of the *American Journal of Dental Science*, and in 1840 the 'Baltimore College of Dental Surgery' was organized under a charter granted by the Legislature of Maryland. Shorly afterwards the great standard work of Dr. Chapin A. Harris, the 'Principles and Practice of Dental Surgery,' made its appearance. The Baltimore College of Dental Surgery, in which Dr. Harris was for a number of years a leading Professor, is not only teh oldest, but if we may judge by results, one of the best in the world. Seven hundred and nine students have been graduated by this institution since its foundation. They are distributed pretty generally through the civilized portion of the globe, and wherever they have located the fame of their *Alma Mater* has

accompanied them. Nearly every Dental College in this country contains in its faculty some graduate of this institution, and a large majority of the Court Dentists of Europe acknowledge their obligations to the same source. The Museum of the College is, without doubt, among the most complete in the United States, possessing a large and rare collection of pathological specimens, while the course marked out for the students is very comprehensive, embracing anatomy, physiology and chemistry, and materia medica the lectures upon these subjects being very full and minute.

Baltimore took the lead in this department of science from the first, and has steadily maintained her position. The students matriculating in this city are not confined to the United States, but many come from the enlightened centres of Europe to avail themselves of the advantages which Baltimore extends to those desirous of acquiring a knowledge of Dentistry."

The Irritation of Rubber Plates.—Dr. C. C. Knowles professes to remedy irritation from rubber plates by employing black vulcanite instead of red, and also to dispense with the "central oavity." He says:

"I have met many cases of irritation of the mucous membrane, especially in the fauces caused by the irritation of the rubber plate. I have substituted black vulcanite, and the irritation entirely ceased. I have been in the habit of using it on account of its strength, especially in partial sets, where we demand a greater strength in proportion to the surface covered. It receives a most beautiful polish, and its texture shows it to be more dense.

"The central cavity may be useful in temporary sets; but after the absorption of the gums has taken place, I think the plate can be better secured in the mouth by a bead around the circumference of the plate, so that it shall perfectly embrace the parts, taking care that it does not come up too high, and that the beading is not so deep as to cause a stoppage of the circulation. Properly placed, it will allow the movement necessary for mastication without displacement. I find such plates give satisfaction and less irritation to the mouth. I trim it so that

the beading shall fall one or two lines within the extent of the plate, as it covers the gum, and within a line or two of its terminus. The terminal edge as it comes against the soft tissues, should not be too sharp, but should be rounded out, especially over the molar process, as there is where irritation is liable to occur."

New Means of Relieving Toothache.—In the *Revue Medicale de Toulouse*, we find the following:

This remedy consists in the employment of injections introduced into the gum near the diseased tooth. Dr. Dop has tried these injections in about one hundred cases. In twenty cases he made use of morphia, which succeeded very well, but only for a time. Chloroform was far more successful, and is now exclusively used by Dr. Dop. It was eminently successful in sixty-two cases out of eighty. The injection is made with the small syringe commonly used in France for subcutaneous injections. Only two drops are put in at a time. The needle is introduced gradually, and must remain *in situ* a few seconds. On withdrawing it, pressure must be exerted on the gum with the finger. In by far the greater number of cases, one injection is quite enough to stop the toothache. In some instances a second injection is needed twenty-four hours after the first. During absence of pain the tooth may be plugged or dressed with creosote.

Corrections.—In the report of the proceedings of the Southern Dental Association, published in the November number of *Dental Cosmos*, on page 586, Dr. Gorgas is made to sav that he framed the constitution of this Association; and also from what follows it would appear that Prof. Cutler had been recommended to fill a totally different position than the one suggested to the Association in the answer of the Faculty of the Baltimore College of Dental Surgery to the proposition made them. The following is a correct report of the remarks of Dr. Gorgas on this subject:

" Professor Gorgas, Dean of the Baltimore College, said that the proposition of the Association had been carefully considered

and respectfully answered by the Faculty of the Baltimore College of Dental Surgery. He asked if the Association was able to assume the burden of supporting a College? Are the members willing to be subjected to a heavy tax in its behalf? Is any gentlemen present, able, and if able, willing to be subjected to a heavy annual tax to support any institution? The Southern Dental Association at the commencement of the present session, consisted of one hundred and twenty-seven members; and, at least one hundred thousand dollars would be required to properly endow a dental college, in addition to all that could be received from students. As one of the founders of the Southern Dental Association, one of the committee who framed its constitution and by-laws, and its first Recording Secretary, he took great interest in its success, and would use his best efforts to have it succeed; therefore any proposition coming from this Association through him, would be zealously advocated.

"The Faculty of the Baltimore College of Dental Surgery placed it in the power of the Association to establish one professorship, and then by degrees to have control over the college by creating new professorships, or endowing old ones, as their means to do so from time to time justified. To place the Baltimore College in the hands of the Association at this time, would result in a failure to support it, and cause its downfall. He had no aspiration for office in the Association. was not a candidate for any office, and hence was honest in his endeavors to do justice to both the Association and the College he represented. He was surprised when he was elected to the office of 1st Vice-President at the Richmond meeting.

"He also stated that in his opinion, the objections against the proposition made to the Association by the Baltimore College, arose from the filling of the chair it was proposed to endow by the Faculty, thereby destroying the aspirations of some members of this Association who desire to become professors in a college, when they do not possess the qualifications necessary for such a position. Again, almost every one who complains of the colleges, is ignorant of their course of study and management, judging them by a few isolated cases occuring years ago when the country was convulsed by civil war, and the majority of the members of the Faculty absent in the army, and when a suspension

would have forfeited their charter, and entailed the downfall of the institution by the persecution of the party then in power."

In an obituary notice of the late Dr. Amos Westcott, published in the *Missouri Dental Journal* the author states that the organization of the Baltimore College of Dental Surgery was due to the efforts of Dr. Westcott. While we admit that Dr. Westcott was a very efficient member of the Faculty of this institution in its early days, we think that great injustice has been done to others in making a statement of this nature which is so wide of the truth.

The founders of the Baltimore College of Dental Surgery, to whom a charter was granted in 1839 by the Legislature of the State of Maryland, were Drs. Chapin A. Harris, Horace H. Hayden, H. Willis Baxley, and Thos. E. Bond. Dr. Amos Westcott did not become a member of the Faculty of this institution until 1846, and resigned in 1849, as the records of the college, now in possession of the writer, will show.

This college therefore had been in existence for more than five years, and graduated five classes before Dr. Westcott became connected with it.

MONTHLY SUMMARY.

Tempering Steel.—Since, in tempering steel, the colors owe their appearance to the formation of an exceedingly thin superficial skin of oxide, it is evident that the steel, when withdrawn from the fire, does not retain its first color, but there appears other colors in consequence of a subsequent oxidation by the air, untill the steel is sufficiently cool. Of a certain color, one can only judge with certainty by examining the conditions under

which it occurs. If two pieces of steel are heated until the yellow color appears, and if one is withdrawn, it may become in the air purple, violet, and finally blue, while the other piece assumes the same colors in the fire. However, if both pieces when blue are dipped into water, they assume different degrees of hardness, *i. e.*, the one which turned blue in the air will be harder than the one left in the fire. Hence it follows that proper caution must be observed in this respect, and steel must either be cooled rapidly, when the right color appears in the fire, or it must be withdrawn at a preceding color, if the color is to appear by after annealing Sometimes it is intended by the process of annealing to give to articles an attractive appearance, and at the same time to prevent them from rusting by the formation of a layer of oxide. In such a case, uniform quality and heating is required.—*Druggists' Circular.*

Removing a Foreign Body from the Nose.—Accidentally opening an old number of "Ranking's Abstract," I read an article headed, "A Novel Mode of Removing a Foreign Body from the Nose," in which is related the case of a child from whose nose surgeons failed to remove a cherry-stone, and were outdone by the village barber, who administerd an emetic, and, at the moment when vomiting was about to commence, clapped a handkerchief tightly over the mouth of the child. I was reminded of the source from which was obtained a procedure I have invariably instituted in such cases, and never without success. Very many years ago, that best of practitioners, Dr. J. P. Evans, (then residing in Arkansas,) when on a visit to his native place Tazewell, Tennessee, was called to the country to see a child with a foreign substance in its nostril, which had held its position in spite of efforts for its removal directed by the professional skill of "all the region round." On the way, the Doctor was saluted by an aged negro woman, who asked him if he was going to see that child. On receiving an affirmative answer, she said: "Put yer finger 'long side the nose, tother side from the thing, and with yer own mouf over the child's mouf, blow hard, and it's bound to come out." He followed her directions, and occasioned the result as she had predicted.—*Atlanta Medical and Surgical Journal.*

Treatment of Chilblains.—"F. Rhien racommends an aqueous solution of iodine and tannin as a remedy for chilblains. He says that the result exceeded his expectations—five applications of the remedy being successfull. The application has also been tried by others, with good results when properly applied. The solution is made as follews: About an ounce of tannin is dis-

solved in half pint of water; seventy-four grains of iodine are dissolved in an ounce and three-fourths of spirits of wine; the two solutions are then mixed; and enough water is added to make up the whole to two and a half pints. The remedy is applied once daily—the best time being before going to bed. The mixture is gently warmed over a very slow fire; the affected part (*e. g.*, the hand) is dipped in it while still cold, and held there until the liquid, on being stirred, feels uncomfortably hot. The vessel is then removed from the fire, and the hand is dried over it, without gloves. The vessel used must be of earthenware or porcelain, not of metal. Care should be taken not to use too great a quantity of iodine, especially when abrasions are present. According to Rhien, four or five applications are sufficient."—*British Med. Joururnal.*

Nasal Calculus.—The following case of nasal calculus is reported by Dr. K. K. Mitter, in the *Press aud Circular*:—

On the morning of the 12th of February, 1873, a girl æt. about five years, was brought to the dispensary by her mother, who stated she had for a long time noticed something in the right nostril of the girl, which impeded her respiration to a slight extent, and which she was very anxious to have extracted.

On making an examination I saw a small oval body in the right nostril, which I thought to be a polypus. On touching it with a probe it was felt to be a hard substance. As the girl became very restless and commenced to cry, I put her under the influence of chloroform. On examining it more minutely, it was found to be a calcareous body firmly adherent to the mucous membrane of the right ala of the nose. It was extracted with a pair of small forceps after dragging it close to the orifice of the nostril by the end of a probe bent in the shape of a hook. It was followed by a gush of bleeding, which was stopped by injection with a strong solution of alum.

The body extracted was found to be a small oval calculus with a distinct hour-glass contraction in the middle.—*Med. and Surg. Reporter.*

Female Professional Education.—The new law admitting female students to the full rights of the Zurich University, has been recommended by the Cantonal Government for adoption, and the popular vote has been taken on it. Zurich seems to be considerably in advance of the rest of the world in this matter of female education, for the number of lady students has steadily increased since the courses were first opened to them informally, six years since; and there are reported to be one hundred and nineteen of these "girl-graduates" who have actually matriculated under the existing university rules which it is proposed to egalize.—*Med. and Surg. Reporter.*

Deep Injection of Chloroform to Tic Douloureux.—Prof. Roberts Baraholow, in the *Clinic*, describes his method of introducing chloroform into the sub-cutaneous cellular tissue, in facial neuralgia. Though considerable pain is produced, yet the pain quickly subsides, no inflammation or abscess ensues, and the neuralgic suffering is instantly relieved. The method is thus described:

The needle is inserted under the upper lip, which is raised, and passed deeply so that its point shall rest near the infraorbital foramen The chloroform is then slowly injected. When the needle is withdrawn, firm pressure from the cheek is made over the point of insertion of the needle, and is maintained for a time to insure the diffusion of the chloroform. At the moment of injection some burning pain is experienced, but this is quickly followed by a feeling of numbness of the upper lip and anæsthesia of the parts into which the chloroform is diffused. In a very short time a distinct swelling is perceived at the site of the injection, which is at first puffy, but afterwards becomes harder and may continue indurated and swollen for a day or two. In a few seconds after the chloroform is inserted decided giddiness is experienced and the gait is staggering. Generally the giddiness passes off in a few minutes, but in one case the patient complained of an intoxicated feeling for two days. Drowsiness has usually occurred; and thus far not decided narcosis in any case although as much as thirty minims has been administered at a dose.—*Pacific Med. and Surg. Journal.*

Atropia and Salivation.—Dr. Wilhelm Ebstein (Breslau) concludes a paper on this subject in the *Berlin Med. Wochenschrift*, as follows:

A work by my friend, Paul Grützner, in Pflüger's *Archiv*, furnishes the proof that irritation of the medulla oblongata is followed by a marked increase of salivary secretion, which is checked on the side in which the chorda tympani and sympathetic have been divided; on the other hand, it continues on the other side, where both or one of these nerves remains intact; so that the assumption of a salivary centre in the spinal cord is justifiable. * * *

Of far greater practical importance is the therapeutic value of atropia in the treatment of salivation as experimental investigations have so clearly indicated. We have, in atropia, a means which markedly relieves the distress of salivation. When I give my patient a hypodermic injection of 0.0016 atropia, I assure him a perfect night's rest, which would be else impossible on his constantly saturated pillow. *In salivation, atropia is the proper narcotic.*—*Clinic.*

The Restoration of Chloroform Injured by Age.—Where changes are induced in chloroform by time, light, moisture or atmospheric pressure, E. B Shuttleworth is of opinion (*Canadian Pharm. Jour.*) that by far the most injurious products of decomposition are chlorine and hydrochloric acid. These products may often be found in an aqueous layer floating on the top of imperfectly rectified chloroform which has been kept some time. The incomplete removal of sulphuric acid which has been used in rectification, also leads to the same change. For the restoration of chloroform that has thus become spoiled, he recommends that it be shaken with a dilute solution of hyposulphite of soda. It should then be separated from the supernatant liquid and again washed; this time with pure water. After being separated, the chloroform should be passed through filtering paper to rid it from traces of moisture, when it will be found much improved and comparatively sweet.—*Med. & Surg. Report.*

A Dentist fined for giving Chloroform.—[*The Clinic;* from the *France Medicale*, April 23, 1873.]—M. Debaralle, dentist at Lille, was brought up before the *audience correctionelle* for having given chloroform without the diploma of doctor of medicine or officer of health, and for having through "*imprudence, negligence, maladresse et inobservation des reglements*" committed an involuntary homicide by chloroform upon the person of a woman named Caron.

The tribune decided that the administration of chloroform without a diploma was an illegal practice of medicine, and that the defendant was guilty of homicide. As he was guilty of two offences, he was fined 15 francs for the first, and for the second 500 francs, with imprisonment for one month.—*Med. Times.*

A Pre-Historic Skull.—The Osage Mission [Kansas] *Journal* gives an account of a late discovery near the western line of the county. It is a human skull imbedded in a rock. and was brought to light by blasting. Dr. J. C. Weibley, of Osage Mission, thus describes it:—

"It is that of the cranium of the human species, of large size, imbedded in conglomerate rock of the tertiary class, and found several feet beneath the surface. Parts of the frontal, parietal and occipital bones were carried away by explosion. The piece of rock holding the remains weighs some 40 or fifty pounds, with many impressions of marine shells, and through it there runs a vein of quartz, or within the cranium crystallized organic matter; and by the aid of a microscope presents a beautiful appearance."—*Med. & Surg. Reporter.*

Chloral for Toothache.—Dr. Page, in the *British Medical Journal*, recommends chloral hydrate as a local application in cases of toothache A few grains of the solid hydrate introduced into the cavity of the tooth upon the point of a quill speedily dissolves there; and in the course of a few minutes, during which a not unpleasant warm sensation is experienced, the pain is either deadened, or more often effectually allayed. A second or third application may be resorted to, if necessary.—*Druggist's Circular and Chemical Gazette.*

Various anodynes will answer the same purpose. Among others, iodoform in one grain doses is a very efficient remedy for dental and facial neuralgia.—*Medical Cosmos.*

BIBLIOGRAPHICAL.

Practical Histology in Vienna, and The Microscopical Study of Blood and Epithelium. Reprinted from the Philadelphia *Med. Times.* By James Tyson M. D. Lecturer on Microscopy and Urinary Chemistry in the University of Penn. etc. etc. Published by J. B. Lippincott & Co., Philadelphia, Pa.

The first part of this pamphlet relates to a recent brief experience of the author in the laboratory of Prof. Stricker, of Vienna, connected with the study of connective tissue. The second part contains researches into Blood and Epithelium by the aid of the microscope, and presents many interesting facts relating to their substances.

Circulars of Information of the Bureau of Education, Washington D. C.. Nos. 1, 2, 3, and 4 for 1873, relating to College Graduates, College Students, vital statistics in the U. S., Schools in British India, College commencements of 1873, and List of Publications by members of College Faculties and Learned Societies in the U. S. 1867—1872. Printed at the Government Printing Office.

An Investigation Concerning the Mechanism of the Ossicles of Hearing and the Membrane of the Round Window. By Charles H. Burnett, M. D., Fellow College of Physicians, Philadelphia. From the Archives of Ophthalmology and Otology. William Wood & Co., Publishers, New York.

Transactions of the California State Dental Association. First, Second, Third and Fourth Annual Sessions, 1870–71–72–73, held at San Francisco.

This is a very handsome record of 217 pages, for which we are indebted to Dr. H. L. Plomteaux, Secretary of the Association.

The Sanitarian. A monthly Journal. A. M. Bell, M. D. Editor. Published by A. S. Barnes & Co., N. Y. and Chicago. Annual Subscription $3 00, single number 30 cents.

A perusal of the December number 1873 will show how useful a publication this is, the contents being School House Ventilation, illustrated. The Bermudas, Nature's Scavengers, Artificial Feeding, Proceedings of Am. Public Health Association, etc. etc.

The Herald of Health. Now in the twenty second volume of its new series, continues its endeavors to improve body and mind by advocating a higher manhood, physical, intellectual and moral. The contents for December, 1873, are Rights of Children, A Scamper across Europe, Our Food, Wisdom Crumbs, True Beauty, Disease Propagated by Milk, Lessons for the Children, Editor's Studies in Hygiene, Desert Table, and Topics of the Mouth.

Published by Wood & Holbrook, 13 and 15 Laight Street, New York, $1 50 per annum. Single copy 15 cents.

The American Agriculturist. Published by Orange, Judd & Co. 545 Broadway, New York, at $1 50 per annum.

This journal the past year fully sustains the character it has so long borne of being one of the best publications of the kind issued. No labor or expense is spared to render its pages instructive as well as entertaining to all engaged in agricultural pursuits. It is issued monthly, and the twelve numbers when bound make a handsome volume, so liberally are they illustrated.

The Physician's Visiting List for 1874. Twenty Third Year of its Publication. Philadelphia: Lindsay & Blackiston.

Proves a useful list or appointment book for the dentist as well as for the medical practitioner. For a number of years we have been using this Visiting List as a dental appointment book, and would regret to be without it. It contains much useful information, such as Hall's Ready method in Asphyxia, Poisons and their Antidotes, Almanac, etc. etc.

Wood's Household Magazine. Published by S. E. Shutes, New York city and Newburg, N. Y. at one dollar per year.

This is an entertaining and attractive journal. The December number, 1873, is replete with good reading, sketches, stories, poems &c, the contents embracing the following articles:

"A Better Country," Mary Hartwell; An Engineer's Yarn, Albert Williams, Jr.; Our Party at Sea, Rev. J. S. Breckinridge; Two Enthusiasts, H. M. Lewtral; Presence of Mind, Rev. F. W. Holland; Our Babies, D. A. Gorton, M. D.; Blessedness of Riches, Tenoroon; Hans Doodledee, Rudolph Mentel; installment of Max Kromer, author of Jessica's First Prayer; Codfish and Potatoes, Chapter II, by Eleanor Kirk; Misery Jippeau, Chapter VII, VIII, by H. V. Osborne. In addition to these articles are several pretty poems, a charming little Cottage Design, and editorial departments embracing Our Housekeeper, Correspondence, Literary Notices, Laughing Stock, &c., &c. The engraving for this month is entitled "Old Folks."

For $1 50 a beautiful chromo is presented with the magazine for year 1874.

Vick's Floral Guide. Published by James Vick, Florist, Rochester New York.

The number for 1874, has been received, and as usual is beautifully embellished, the frontispiece being a magnificent colored plate of a double Portulaca. This useful guide is published quarterly at the low price of 25 cents a year, the whole number containing 200 pages, 500 engravings and a colored plate, and printed in English and German. Mr. Vick is one of the most enterprising and liberal gentlemen in his profession, and the quality of the seeds he sends out every year cannot be surpassed. He truly merits the success which has attended his efforts.

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ARTICLE I.

The Larynx the Source of the Vowel Sounds.

BY THOMAS BRIAN GUNNING, NEW YORK.

What I have observed in dental practice, associated with much special attention to speech, as heard in different forms of the mouth, from infancy to old age, not merely in normal conditions, but also in congenital and acquired deficiencies of the palate, and other defects, having convinced me that the source of the vowel sounds is misunderstood by those considered as authority upon the subject, I propose to show:

First, how the vowels are said to be formed in the mouth;
Second, that they cannot be formed in the mouth;
Third, where and how they are formed.

The human larynx divided into upper and lower cavities by the inferior or true vocal chords, and protected by its movable cover, the epiglottis, is well known to be the organ of voice. It is also understood that voice is produced by the air being forced from the lungs through the trachea

and vocal chords, and that the pitch of the tones depends upon the vibrations of the vocal chords, as modified by their length, width, tension, etc., while the volume of the tone is regulated by the parts below.

It is also known that each tone of the voice has not only its fundamental tone, but that it includes also what are known as overtones, these being tones whose rates of vibration are twice, three times, four times, five times, etc.—that of the fundamental, and that different admixtures of the fundamental, and one or more of its overtones form the vowel sounds of speech and song. After much investigation and experiment by men of science, it has been decided that this change of vocal tones into the vowel sounds is made in the cavity of the mouth, say all parts of the vocal tube above the epiglottis. It is supposed that, by appropriate changes in these parts, the resonance of the mouth re-enforces the tone peculiar to the required vowel. The following references to what has been done and said by prominent investigators will make the views now held as to the formation of the vowel sounds more clear. In the year 1799 the Royal Academy of St. Petersburg made the vowel qualities a prize question. Kratzenstein submitted a memoir and also showed how the vowels could be produced by artificial mechanism, and the prize was awarded to him. Von Kempelen, of Vienna, made similar and more elaborate experiments. These scientists stated that the tones of the larynx were changed into vowel sounds by alterations in the size of the oral opening, and the oral canal, that is the aperture between the lips and between the tongue and palate. Mr. John Bishop in his work "On Articulate Sounds and on the Causes and Cure of Impediments of Speech," London 1851, page 17, says: "Vowels have been divided into three classes, having reference to the organs employed in their production, namely, guttural, palatal, and labial," and he endorses these views by explaining how the organs act, and brings in prominently certain vibrations of the lining menbranes of the parts which he considers to be

specially active; in the gutturals, the membranes of the fauces, pharynx and soft palate; in the palatals, those of the dorsum of the tongue, and of the hard palate; in the labials, the vibrations in the lips and cheeks. This author also thinks that the change from the sound of *o*, as in bone, to *oo* as in boot, is entirely due to the closer and more projecting position of the lips, and he states distinctly that certain positions of the organs above the epiglottis are indispensable to articulate speech. He thinks that the vowel quality pulsations may be produced by either the air in the mouth, pharynx, and nostrils, or by the *membranes* of these parts; the first, being perhaps, the opinion of Dr. Thomas Young, the last, probably, more according to M. Savart. Mr. Bishop does not state clearly that he inclines to one view more than the other, but evidently thinks the vowel qualities originate in part from both sources.

Professor Tyndall, explaining the nature of the vowel sounds in his fifth Lecture on Sound, at the Royal Institution of Great Britain, published in New York, 1867, says: "We can distinguish one vowel sound from another while assigning to both the same pitch and intensity." * * * "Now, in the vocal organ of man, you have your reed in the vocal chords, and associated with this reed you have the resonant cavity of the mouth, which can so alter its shape as to resound, at will, either to the fundamental tone of the vocal chords or to any of their overtones. Through the agency of the mouth, we can mix together the fundamental tone and the overtones of the voice in different proportions, and the different vowel sounds are due to different admixtures of this kind." Professor Tyndall then selects a tuning fork of a suitable pitch for the required sound, and adjusts his mouth until it resounds to the fork, and then urges air through the larynx, when the particular vowel sound is heard and no other. In this way he decides that it requires the first, second, third, fourth, fifth and seventh tones to form all the different vowel sounds, upon the same fundamental tone of the vocal chords, and the precise tone or tones re-

enforced by the mouth for the particular sounds are for U (*oo* in hoop,) 1st or fundamental; O, 2d; A, 3d strong, 2d moderate, 4th and 5th weak; E, 1st weak, 2d comparatively strong, 3d feeble, 4th intense; Ah! 3d feeble, the higher tones especially, 5th and 7th strong. Upon this theory the mouth re-enforces tones ranging in pitch through three octaves less one tone to form the vowel sounds of speech on the same fundamental tone of the vocal chords, and this range of the mouth's re-enforcement must be increased in proportion to the range in the pitch of the tones of the vocal chords.

Madame Emma Seiler's views upon the formation of the vowel qualities are of great importance, from the fact that she was associated with Prof. Helmholtz in his experiments to ascertain the nature of these sounds. In the translation of her work, "The Voice in Singing," Philadelphia, 1870, she explains the nature of the vowel qualities, as explained by Prof. Helmholtz, and as just now given in the quotations taken from Prof. Tyndall's lecture. Madame Seiler, however, on page 96, says: "But certain vowels, in certain parts of the scale, can be sung far more easily and sweetly than others. The investigation of this fact has taught us that a tone gains in richness when the tone corresponding to the vowel belongs to the overtones of the fundamental tone." This seems to indicate that Madame Seiler considers that the vowel quality is given to the fundamental tones in a fixed range of pitch, and that it does not rise and fall with the pitch of the tones from the vocal chords, as Prof. Tyndall seems to intimate. Mme. Seiler's work shows uncommon acuteness and familiarity with the subject. She says: "The female voice has only a few tones more than an octave upon which every one of the vowels can be distinctly sung;" and on page 114, that "The length of the cavity of the mouth is the greatest in sounding *oo*, the least in *e*, intermediate in *a*." 'In the pure, clear *a*, as in *may*, the cavity is the narrowest.'

It is difficult to discover any practical difference between

Prof. Tyndall's and Mme. Seiler's views, and those of Mr. Bishop, upon the action of the organs in forming the vowel sounds of *speech*. They, however, seem to think, that the vowel qualities originate in the general resonance of the mouth, rather than in the vibrations in the membranes of any particular part of it. Many have written upon the vowel sounds of speech, but it is difficult to find in the writings of any one author, all that is necessary to give a comprehensive view of what is now believed in regard to them. This arises not so much from any material difference in the views held, as in the special subjects, upon which the writers were engaged. I have, therefore, selected from those whose writings collectively seem to embrace what will give an easy and sufficiently full idea of what is held respecting them. Mr. Bishop writes upon speech and its impediments; Prof. Tyndall, more upon the strictly acoustic bearings of the subject; Mme. Seiler, more upon the voice in singing.

Mr. Bishop describes minutely how the consonants are formed, and the positions taken by the organs of speech in doing this, have an important bearing upon the subject matter of this paper; for the consonants are associated with vowels in the formation of words, and they have also their own special sounds readily distinguished, while the movements and positions necessary to their production are easily demonstrated.

I propose to show briefly some of the movements made in forming the consonants, and the probable effect of these upon the vowel sounds, if these last also originated in the mouth, but first giving a description of the parts used in speech above the epiglottis.

The lower jaw which protects the tongue, larynx and trachea, also gives attachment to muscles which control them in the performance of their functions. Its co-operation in these functions is effected principally by the *temporal* and the *external pterygoid* muscles, the first pulling the upper part ot the ascending ramus backward, and the last drawing it forward. This shuts or opens the teeth and regulates the

position of the lower jaw. Thus the *digastric* and other muscles attached to the body of the jaw, and to the hyoid bone, have a base of action, and without this, vocalization and articulation would be impossible. This will be more clearly understood by recollecting that with the teeth closed, the stylo maxillary ligament *slants* down to the angle of the jaw; therefore, while the *temporal* muscle relaxes to allow the *external pterygoid* muscle to draw the condyle forward under the *eminentia articularis*, the angle is, at the same time, carried back by the ligament, into the perpendicular of its attachment on the styloid process. This allows the jaw to go down bodily, as well as open in front, by which the back teeth of the upper and lower jaws are widely separated, and the size of the oral cavity much enlarged. The nose, with the nostrils through which the air passes to and from the pharynx at the back of the mouth cavity, and the upper and lower lips, with the separation between them, which gives passage to and from the front of the mouth, are well known. The nose can vary the size and position of its anterior openings to a limited extent, but as a whole moves only with the head. The upper lip moves less on its attachment than the lower, this last moving freely with the lower jaw to the full extent to which this bone can carry it. These movements are much less in some persons than in others. The cheeks have also a varied amount of mobility, but yield readily to all the movements of the lower jaw. Each cheek is well controlled by a thin broad muscle, the *buccinator*, which arises from the alveolar process on each jaw, continues forward into both upper and lower lips, and backward on to the pterygo-maxillary ligament, from whence on each side, the *superior constrictor*, a similar muscle, curves back to the centre of the pharynx. These four muscles lie just under the mucous membrane, which covers the inside of the cheeks, and all the parts within the mouth, except the teeth, continues up into the nose, and through the larynx into the lungs. The teeth which stand around within the lips and cheeks, are in the

complete temporary set, twenty in number, and should be all in the mouth at three years of age. By six, the jaws have enlarged behind the last infant teeth, for the first permanent molars; by twelve, for the second; and by eighteen, the third permanent molars are generally present. Then the permanent teeth, thirty-two in number, should all be in the mouth, the cavity of which then averages four or five times larger than at the age of three. Its capacity ranges in the adult from two to four fluid ounces, males having the larger. Through early loss of teeth and other causes, the adult mouth has, in rare cases, less than two ounces capacity. I have never found one which could take in over four ounces of water without swallowing some. The separation between the lips varies much in size compared with the cavity within, and the hard palate, which forms the roof of the mouth, is singularly unlike in size and shape in different persons. The soft palate which extends backward from the hard palate, is complicated in its movements and requires close attention. It can be seen curving downward and showing in its centre the uvula which hangs below its back border. The uvula is the centre of two distinct arches, formed by two pairs of muscles, which are separated below by the tonsils. The posterior arch is smaller than the anterior, and therefore, also well separated from it above. It is formed by the *palato pharyngei* muscles, which by their anterior fibres go down and are inserted into the thyroid cartilage, while the others pass around the sides of the pharynx and some cross each other behind. The anterior arch is formed by the *palato-glossi* muscles, which are inserted into the tongue. The uvula is itself the insertion of a pair of small muscles, which pass back from the centre of the hard palate; while the *levator-palati* muscle comes forward and downward over the edge of the superior constrictor on each side, and spreads out in the upper surface of the soft palate. This pair are the antagonists of those which pass to the uvula from the hard palate. The *tensor palati* of each side controls the tension of the soft palate. The form of the hard

palate is such, that the tongue can close up against the edge around the inside of the upper teeth, while the back part of the tongue is so shaped, that it fits the uvula and soft palate exactly, and this closure can be made readily at the same time that the upper and back part of the soft palate also closes the posterior nares.

The tongue at rest lies with its point within the lower front teeth, rising gradually to its centre, where it curves suddenly down to its connection with the epiglottis, which fits up against it. Just below this the hyoid bone gives support to the tongue, and passes back around on each side, giving attachment by its upper and inner border, to a broad fibro-elastic membrane, which is also attached below around the upper border of the thyroid cartilage. From the back end of the hyoid bone on each side, a round elastic ligament also goes to the superior cornu of the cartilage. These attachments allow considerable movement between the hyoid bone and the thyroid cartilage. The tongue, above and in front of these, has singular mobility. Its point can be put out through the lips, up behind the teeth, against the gum, or drawn back in the mouth; it can also be turned down in front, below the back of the inferior incisors, while the centre goes up close into the roof of the mouth, and the part near the epiglottis is drawn so far forward, that the end of the finger may be placed between them, and this with the epiglottis up, and also pulled forward with the tongue. The tongue also, while fixed in the roof, can be drawn forward at its base so much that the epiglottis going forward with this part, is entirely protected by the tongue above it, as in swallowing. Other positions of the tongue are so easily seen, as not to require explanation here.

It is not surprising, with this wonderful flexibility of the tongue, and the complexity of the parts associated with it in speech, that even such a competent surgeon and so precise an observer as Mr. Bishop, should consider that the vowel sounds were formed in the mouth, and it requires close attention to arrive at a conviction that they are not.

It must be borne in mind that all words, whether in speech or song, without *m* or *n* in combination, are uttered with the soft palate drawn up so as to shut off the nose. This is easily proved by holding the nose shut with thumb and finger, when after sounding any letter of the alphabet other than *m* or *n*, the opening of the soft palate will be heard and felt. It comes down sooner in some sounds than in others. In singing low tones, as seen in the mouth, it appears to be open, but this is so only in its lower border, and in sounding low tones, with the nose closed, it takes much longer to open than in high tones, in which the velum is drawn up tight, and the tension of the parts then opens it quickly. The velum is drawn up back by the *levators*, which enter the palate above. The small muscles between the spine of the hard palate and uvula, draw the velum down in a curve to fit the tongue, and if the finger is laid upon the tongue so as to press it down where the uvula strikes it in swallowing, or in sounding the guttural consonant *k*, the uvula, if short, will come forward and its back lay upon the finger; while the tongue and velum are in contact to sound *k* or *g* hard, and kept so, the nose can be opened instead of sounding either letter and the sudden current of air will prove that it was firmly closed behind, and this closure is complete even with the larynx prepared to sound the lowest tones of the voice. This isolation of the nose, except in sounds of *m* and *n*, makes it unnecessary to give any special attention to the resonance of its cavity.

Mr. Bishop defines the guttural consonants to be *c* and *g* hard, *k*, *q*, *ch*, *gh*, and says: "The vowel sounds pronounced in *ball*, *bar*, *bat*, *but*, are guttural."

He says *t*, *d*, are lingua-palatal consonants, and the vowels in *bate*, *bet*, *beat*, *bit*, palatal.

He says *b*, *p*, are labial consonants, and the vowel sounds in *bone* and *boot*, labial.

These different sounds are formed upon a tone originated by the vibration of the vocal chords, this tone not being at all altered in pitch, but only so that the vowel quality is

given to it, and so far as the consonants as used in speech, are more than the mere beginning or ending of a syllable or word, they consist of some vowel sound, and this, although slight, is readily distinguished, for *t* or *k*, in combination with the same vowel are not confounded, although both are formed out of sight.

Now, if the consonants and vowels, classed as guttural, were sounded only with each other, it would be easier to believe in Mr. Bishop's theory; but the guttural consonants are used quite as well with the palatal and labial vowels, and the labial and other consonants are also used with all the vowels. In fact, while any consonant is used with any vowel, consonants of the different classes are used with the same vowel, or the same vowel sound, in syllables and words having one continuous vowel sound. For instance, in sounding *cop*, there is no alteration of the vowel sound, but on Mr. Bishop's theory, *cop* could not be sounded at all, for in passing to form the labial *p*, it would end as *coop*; the word *cob*, would be *co-oob* as the lower lip closed to form b.

I have thus far confined myself to *o* and *oo*, as Mr. B. says the transition from one to the other is entirely due to the change in the state of the lips. Now, if it be said, that state of the lips may be more than position, that it may also include vibration—take the word *cove*. Here the lip in closing up to form the *v*, also vibrates, but although it goes up past the position for *oo* and then rests in it, the word gives no sound of *oo* whatever. It is clear therefore, that something more than position, or *state* of the lips, is needed to make the difference between *o* and *oo*.

These examples could be multiplied, but without advantage. We know how and where the consonants are formed. and in the transitions from one to the other, it is impossible that a pure vowel sound could continue unchanged, were they formed in close proximity, indeed in the mouth at all. Mr. Bishop himself says: "Diphthongs are not merely sounds resulting from the combination of two simple vowels following each other in rapid succession, but are also in part

the effect of the movements of the articulating organs on the vowel sounds, during the transition of these organs from the position of the first vowel to that of the second." Now if the vowel sounds originated in the mouth, during transition of the organs to form different *consonants*, the continued vowel sound between them would be altered. With these movements it is impossible that vibration of the parts designated can add the vowel quality to the fundamental tone of the voice, and also hold the vowel sound steady and pure. Further, the vowel sound may be formed well, although the fingers are against the teeth in place of the lips, and also in cases of congenital cleft palate, where not only the soft but the hard palate, and even the upper lip is deficient. Of course in these cases the sound is more or less nasal. But this is remedied by a plate of hard rubber, which covers the whole of the roof of the mouth, passes up above the remnants of the soft palate, fills up all across, and ends in the pharynx opposite the tubercle of the atlas. By this, vibrations of the hard and soft palate and nearly the whole of the pharynx are cut off, but the vowel sounds are perfect, and the consonants so far, that the imperfect condition of the palate is not suspected; and there can be no vibration whatever in the hard rubber. The vowels are perfect when all the gum of both jaws, and the roof of the mouth are covered with plates holding artificial teeth, the plates being of hard rubber, metal, or porcelain, and vibrations in, or beneath them impossible. Nor is the vibration, nor in fact the presence of the tongue indispensable; for the records are indisputable which show that the loss of the tongue is not followed by loss of speech, and that the *vowel* sounds are articulated perfectly with the tongue cut off nearly against the epiglottis.

It is necessary to consider carefully, at this point, what this change of tone to vowel sound is in acoustic quality, or value. This is not definitely settled. Mr. Willis,* quoted

* Cambridge Philosophical Transactions, Vol. iii. 1829.

largely by Mr. Bishop, and referred to by Prof. Tyndall, makes the difference in pitch between the vowel quality in *ee*, as in *see*, and *o*, as in *no*, to be three octaves and a fifth (g'''' to c'') marking that in the lowest vowel sound *oo*, as in *boot*, indefinite. This would make a difference of, say, four octaves between the highest and lowest vowel quality. He used a reed which sounded the same fundamental, and the pipe which surmounted the reed and resounded to it, had always the same outlet, but was varied in length to make it yield the vowels, the length for *ee* being .38 of an inch, and for *o*, 4.7 inches,—over twelve times longer. This difference in the depth of the resonant cavity would be increased to sixteen times for *oo*, the lowest vowel quality, if this vowel sound were just four octaves below *ee*,—the intermediate vowels being obtained between these extremes.

Prof. Helmholtz gives a scale of four octaves less a tone and a half, in which the overtones of the vowels as pronounced in the north of Germany are particularly strong.

Dr. C. L. Merkel, of Leipzig, gives a range of three octaves, less two and a half tones, to the pitches of the vowels, according to his own habits of speech.

Prof. Tyndall says it requires three octaves less one tone to form the vowel sounds upon the same fundamental, and this range must be increased as far as the tones of the vocal chords range. Now the range of the voice in speaking and singing, being, say, two octaves, full two-thirds of this range of the fundamental tones, and their overtones should be so re-enforced by the mouth as to form perfect vowel sounds. To do this, every mouth must alter so as to augment tones ranging through four octaves and a third; and as the male voice is an octave lower than the female, the range of tones necessary to be re-enforced by the mouth in both sexes is over five octaves. For the purpose of this paper, however, it is not important that the scale of the vowel qualities should be precisely known.

In the mechanism used by Mr. Willis, to find the acoustic values of the vowel qualities, the pipe was necessarily greatly

varied in length. This presents, at once, an insurmountable objection to the theory that the vowel qualities of speech originate in the cavity of the mouth, which has little capability of altering its length. In other respects, however, the acoustic possibilities of the mouth, are not so easily settled, or the matter would have been decided long ago.

In Willis' experiment we see that the resonant cavity of the pipe is longer, compared with its outlet, in proportion to the gravity of the tone, and shorter as the tone becomes acute. It may, therefore, be thought that the equivalent of this change in the resonant cavity, would be found by varying the size of the outlet, the cavity remaining the same. My own experiments show, however, that in a glass bottle having a mouth about one inch in diameter, partly filled with water, leaving a space of four and a quarter fluid ounces capacity, the cavity resounded to c''; with the mouth half closed, b' flat; while g', only two tones and a half below c'', would not resound at any closure.

To show the effect of lessening the resonant cavity, while retaining the same opening, $3\frac{1}{2}$ ounces of space gave c''; $2\frac{1}{2}$, g''; $1\frac{5}{8}$, c'''. This $3\frac{1}{2}$ ounces of space is about the capacity of a large adult mouth, yet this space reduced more than one half, by pouring in water, resounded to a pitch only four tones, or two-thirds of an octave higher. This arose from the water not filling up half the length of air space, as the bottle was wider below than at its neck. In a straight tube to fill half the space, would halve the length, and the empty part would resound to an octave higher.

Four straight jars without necks, their capacities being respectively $1\frac{1}{2}$, $2\frac{3}{4}$, $4\frac{1}{2}$, and 9 fluid ounces, covered with the same sheet of gutta-percha, with an opening in the centre about the shape and size of a small mouth, the opening, that is, between the lips responded to c''', g'', e'', b' flat. This is a difference of only one whole tone more than an octave, between the largest and smallest jars, and yet the large jar was three inches deep—just twice the depth of the small one, and six times its capacity. The three smallest jars differ

in size far more than any cavity of the mouth, from any possible alteration made by the tôngue in speech; yet their whole range of pitch was but four tones, and even this was caused by the difference in their depth of air cavity, which was far greater in any two of them than is possible to the cavity of any one mouth in speech.

Length, or depth, has more influence on pitch, than mere size of cavity, yet a proportionate size is also necessary; for a wide mouthed bottle filled with water to three inches from the top, and resounding to *c''*, on being laid down so far that the water came just to the edge of the mouth, by which the space was doubled in length, but still the same in size, resounded to only one tone lower, not the octave lower, as it would had the space been doubled in size, as well as in length, instead of tapering. Again a straight tube, with space four inches deep, and of 2¾ fluid ounces capacity, resounded to *e''*; and on laying it down as above, to *c''*, two tones lower. These resonant cavities were respectively three and four inches deep, while the mouths of adults, between the back of the pharynx, and the closing ridge of the lips, generally range from three and a quarter, to three and three-quarter inches, rarely being as short as three or as long as four.

By these tests of mere resonance made, like Prof. Tyndall's, at the outlet of the cavity it is seen that *altering the size of the outlet* affords but a very limited range in the pitch of the tone; further that a cavity of a certain size, *double in length, but without increased capacity*, varies only a little in its tone or key note, and finally that changing the size of the resonant cavity without proportionate *increase of length in one direction*, has also but little effect on pitch. The mouth has only the most limited power to lengthen its cavity, and this is confined to the lips, for the constrictor muscles which give form to the sides and back of the pharynx, are firmly held in the centre behind. These experiments show therefore that the human mouth cannot form the vowel qualities, by altering its outlet between the lips, its shape, or its capacity.

The remarks previously made as to the effect of cleft palate, and imperfect lips, loss of the tongue, and other acquired injuries, are equally pertinent here; for any one of them would prevent the resonance of the mouth from forming the vowel qualities; and as the vowels are comparatively perfect in such cases, it is clear that they originate elsewhere. In fact, if they did not, speech would be impossible, for the changes in the organs to form even the consonants, would prevent a continuous and pure vowel sound in any syllable into which they entered, if the resonance of the mouth had any considerable influence.

Further, the changes in position of the organs, as seen in singing, show plainly that they act in subordination to the general pitch of the voice as a whole, and not for the addition of the vowel qualities. In high tones the mouth opens wide; in low tones the lips are comparatively close; while the soft palate is high and tense in acute tones, but low and loose in grave tones; and these great changes, so plainly seen, are made to enable the mouth to transmit the tones of the larynx, which with all its special parts for forming the voice, and varying its pitch, gives less than two octaves range to the average of voices, as used in singing, or far less than the range of pitch necessary in the vowel qualities, to form the vowel sounds of any one person.

It is thus clearly seen that the mouth is supplied with the vowel sounds already formed upon the tones of the larynx. I purpose to show now, that the addition of the vowel qualities to the tones of the vocal chords is made in the upper cavity of the larynx. This cavity is bounded below by the true vocal chords, which pass back in the thyroid cartilage from their attachment on each side of the centre, corresponding to the vertical ridge so prominent and easily seen in the male larynx in front of the throat. The vocal chords are attached in the inside, a little above the small membrane felt as a notch in the front of the neck, at the inferior border of the thyroid cartilage. The false vocal chords are close above; and, higher still, at the inside of

the extreme point known as the *pomum Adami*, the ligament of the epiglottis is attached. From this point, the upper edge of each side of the cartilage may be felt, curving upward and backward, and if the finger is laid on the membrane between, the body of the hyoid bone will be felt above, as a hard round projection in the soft parts within the lower jaw. The support given by this bone to the larynx by means of this membrane, which passes down around to the upper border of the thyroid cartilage, has been before spoken of. The epiglottis passes up from its ligamentous attachment to the thyroid cartilage, and is attached by an slastic ligament to the inside or posterior surface of the body of the hyoid bone, after which it emerges at the back of the tongue, as a broad elastic cover to the superior aperture of the larynx. The tongue, as before stated, commences at, and rests upon the top of the hyoid bone. This bone, however, is not the only connection between the tongue and epiglottis, as three folds of mucous membrane also link them together in the mouth. The point of the thyroid cartilage in front of the throat, known as the *pomum Adami*, is some distance below the hyoid bone, but in swallowing it may be felt to rise up close to the bone, and then go forward with it toward the inside of the chin. This is the highest position which the cartilage can reach, and, by following it with the finger, we feel that the upper cavity of the larynx is subjected to great changes in shape and capacity. During the act of swallowing it may be noticed also, that the tongue is fixed in the roof of the mouth, and the hyoid bone, therefore, in going forward, draws the larynx, epiglottis and base of the tongue under the part above. By this, the epiglottis, which is usually upright, is carried down backward over the superior aperture of the larynx, which is thus closed, and well protected while food passes down behind. With the finger upon the thyroid cartilage, it may be felt that its sides widen rapidly from the *pomum Adami* in front, and, as the vertical ridge in front recedes down to the lower border, and the upper borders of the thyroid cartilage, with

the membrane between, (which, with the attachment of the epiglottis extend up to the hyoid bone,) also recede, it follows that the inner surfaces of the front of the upper cavity of the larynx, converge to the inside of the point of the *pomum Adami.* The upper surface, however, along the course of the piglottis, and the aperture, as well, which the latter modifies, vary considerably in deglutition, vocalization and ticulation. In movements of the tongue outside of these functions, the hyoid bone, although supporting the tongue, changes but little in relative position to the thyroid cartilage, and in mere movements of the jaw to open the mouth, the hyoid bone, and the thyroid cartilage are virtually motionless. Consideration of these statements of the movements in deglutition will assist in discriminating between them, and those of vocalization and articulation yet to be considered. If the arm is laid upon the breast, with the forefinger resting on the membrane between the superior borders of the thyroid cartilage, and its end against the hyoid bone, while the second finger and thumb lay hold of the cartilage below the *pomum Adami*, any movement in these parts will be distinctly felt. The hand may be steadied equally by resting the knuckle of the forefinger against the chin above. Allowance must be made in the latter position for movements of the jaw in opening the mouth, and in the former for movements of the breast in breathing.

TO BE CONTINUED.

SELECTED ARTICLES.

ARTICLE II.

Death from Ether in a Dental Office.

From the *Boston Medical and Surgical Journal* we learn the following particulars concerning a case which has caused considerable excitement in Boston :

The announcement in the morning papers of November 11th that on the previous day the death of a lady by ether had occurred in the practice of Dr. Eastham, a dentist in this city, caused much excitement in professional circles. The death had taken place about noon, but very few, except those particularly interested, were aware of it till the next day. The coroner, Dr. Ainsworth, who was called in directly after the accident, formed a jury of physicians and apothecaries and ordered an autopsy. This was made the next morning by Dr. R. H. Fitz, Pathologist to the Massachusetts General Hospital, and on the same day the jury met, and, having viewed the body, ajourned till the 14th. Before our last number went to press, we had barely time to collect sufficient evidence to justify the statement which we made, that the anæsthetic was either chloroform or a mixture of chloroform and ether. The latter proves to be the one used. The jury met again on the 14th, and having heard a part of the evidence re-adjourned till the evening of Wednesday the 19th. We shall refrain from comment on the evidence till the verdict is rendered, but present the following account of the proceedings which we condense from a complete stenographic report taken especially for us. On Nov. 14th, the first witness was Dr. Edson, who testified that he had twice attended Mrs. Crie, the deceased, during

her confinements, but had never givien her an anæsthetic, though she desired it. This was owing to his disapproval of anæsthetic during labor, except in rare cases. He would have given one to the deceased as readily as to any patient in her case.

Dr. Fitz was next called, and read the following account of the autopsy :—

Examination made twenty-one hours after death. Body preserved in ice; rigidity well marked; no discoloration of face or anterior portions of the body; skull cap and dura mater normal; longitudinal veins empty; moderate amount of blood in the veins of the arachnoid; nothing abnormal observed at the base of the brain. The blood-vessels in this region contained but little blood; cerebral substance firm, containing much less blood than usual, not particularly moist; absence of any anatomical changes; ventricles apparently normal. Pericardium healthy. Heart moderately contracted, unusually small and of usual color; aorta of less than the normal calibre, walls unusually thin and elastic; cavities of the heart contained dark fluid blood, of no unusual odor or color: right side of the heart contained more blood than the left; valves healthy, muscular substance apparently normal. Pleural cavities healthy, containing a small amount of reddish fluid. Lungs of a bluish-red color, the posterior dependent portions quite dark; tissue contained air and a somewht increased amount of blood; absence of any special degree of œdema; in upper lobes of both lungs a rare, small, cheesy nodule. The larynx, trachea, bronchial tubes and the larger vessels at the root of the lungs free from changes. Spleen of normal size and firmness, the color dark blue. Kidneys unusually firm, capsule rather more adherent than usual; in sections, the organ was of a grayish slate color; bloodvessels including the malpighiam organs, unusually distinct from the presence of blood; tubular structure apparently healthy. Bladder healthy. Uterus and ovaries well developed; an old *corpus luteum* present; the lining membrane of the body of the uterus

unusually injected, covered with a viscid, bloody fluid. Liver of normal size, dark color, containing rather more blood than usual, otherwise healthy; stomach and intestines presented no unusual appearances.

The anatomical examination gave no evidence of recent disease of any of the organs, or of chronic alterations sufficient to account for death; the fluid conditions of the blood, the diminished amount in the brain, and the increased amount in the thoracic and abdominal organs were abnormal, and might have been the result of various causes; the diminished size of the heart and of the aorta were probably of congenital origin.

Question. Do you consider the absence of blood in the brain and cerebral cavities as abnormal? *Answer.* Yes, sir.

Q. Do you ever find the blood liquid so long after death, except where chloroform is used? *A.* Yes, sir; it is so in any case of death from asphyxia, in cases of poison from certain gases, and in cases of some very malignant forms of disease where decomposition is very rapid.

Q. I suppose a perfectly healthy woman would not be likely to have this sudden change take place in her without some cause similar to those you have mentioned? *A.* Very unlikely.

Dr. Eastham then testified that he graduated in medicine in 1841, had practised dentistry nearly all the time since, and had used anæsthetics from their introduction. The deceased had been his patient for twelve or fourteen years, during which he had on several occasions given her anæsthetics, chloroform, ether and gas, both severally and in combination. The deceased came to his office in the forenoon of the 10th, and there met Mrs. Sawyer, whose tooth he extracted after giving nitrous oxide. Mrs. Sawyer urged the deceased to take gas, but she insisted upon ether. He made of a little mixture *chloroform and ether*.

Question. You made a mixture at the time? *Answer.*—Yes, sir; I usually do that way.

Q. Please tell whether or not on this occasion you measured the quantity? *A.* No. I have been so familiar

with it that I usually guess at the proportion. I never measure it. I always calculate to have more ether than chloroform.

Q. How much of this mixture did you make? *A.* Not more than an ounce or an ounce and a half.

Q. How did you administer it? *A.* I always administer it on a sponge. I always drop the window at the top, so as to have fresh air. I pour on to this sponge (it is a hollow one about the bigness of my two hands) about a big teaspoonful, as near as I can judge.

Q. That would have been about a third of the mixture? *A.* No, not so much as that. I always begin gradually in applying it, first holding the sponge a little distance from the nose and then moving it nearer. As she began to breathe it, she said, "Give me enough this time, sure." This she repeated three times. I did not fully etherize her, nor did I intend to. After she had breathed two or three minutes, I said to her, "I am going to take this tooth out." She shook her head, as much as to say she was not ready but I took hold of the tooth. She straightened back, groaned and screamed a little as if in pain. After I had pulled the tooth, she went back into a sort of hysterics, and became rigid, as if in spasms.

Q. At this point in the case, did you notice her lips, whether they were pale? *A.* Not much.

Q. Any change in her countenance? *A.* Not much.

Q. Did you notice her eyes? *A.* They were set wide open, like one in a spasm.

Q. You did not notice whether there was anything particular about the lips? *A.* No.

Q. Did you try the pulse at that time? *A.* No. I seized a napkin, moistened with water, and gave her a splash on the forehead. She seemed to revive, and I saw a flush of color come over her face. I set her up and took my ammonia water and applied that to her nose; then I spoke to Mrs. Sawyer. Mrs. Crie was sitting up in the chair, inclined a little forward at that time, and I was applying am-

monia and water to the face. Mrs. Sawyer came in, and I asked her to loosen her dress, which she did. Then I saw a change again, back to paleness. and I said, "Call the other doctors." Dr. Osgood arrived first. We unloosed Mrs. Crie's corsets. Dr. Osgood rubbed her spine, and I sent the porter after another physician. We continued to rub her and apply very strong ammonia, and, finally, after Dr. Damson came in, we removed her to the large room and, raising her arms, tried in every way to set up a respiration. We sent for a battery and used that. We worked over her till we all came to the conclusion that she was past all restoration.

Q. Can you tell us how long after she fell back into this spasm it was before respiration ceased? *A* I should say about fifteen minutes.

Q. How long did the the flush continue? *A*. It might have been two minutes.

Q. Then, as I understand, she fell back at once? *A*. As soon as the shade went back, I called for help. After administering these anæsthetics, there are two peculiar shades. There is the shade for faintness, and a shade from sickness at the stomach, and they are perfectly distinct.

Q. What was your opinion of this peculiar shade then? *A*. I thought it was a pallor from faintness.

Q. From the time she had this spasm and during the time you were administering the ammonia, was she sitting up in the chair? *A*. Yes, sir; but after the doctors came in they removed her to the waiting-room and laid her down.

Q. Was she breathing then? *A*. She was dead.

Q. How long had you begun the administration of ether before you extracted the tooth? *A*. About a minute or a minute and a-half.

Q. During that time did you feel no pulse? *A*. Never do that. Always watch the side of the head, the temporal artery.

Q. Do you think there is any danger of death occurring from giving ether alone? *A*. I never had anything that appeared like it myself; nor in chloroform.

Q. You have not considered then that there was any danger? *A.* No, I do not—that is, unless you administer it as they do in England, I should think they would kill every other one, by using a napkin as they do. But if chloroform be given as I give it on a sponge, with plenty of fresh air, I don't consider it any more dangerous than ether; but a person must discriminate between individuals, whether he would give ether, or gas, or chloroform or anything, and these things must be learned by practice.

Q. You considered her to be a person lacking somewhat in vitality, and therefore you didn't choose to put her fully under the influence of it (the anæsthetic?) *A.* Yes, sir.

Q. Do you consider either of these anæsthetics more dangerous than the others? *A.* I suppose chloroform would decompose blood quicker than ether.

Q. Do you know of any difference in chloroform? *A.* I have never used but one kind, Squibb's.

Q. In what way do you keep it? *A.* Always in a dark closet and corked as tight as I can.

Q. Do you know of any difference in the quality of ether? *A.* No, only from the seller's opinion of it. I use Powers and Weightman's concentrated.

Q. How much of this mixture did you generally make at a time? *A* Not more than a couple of ounces at once.

Q. What was the proportion of chloroform that you generally intended to have in? *A.* Less than half, by volume.

Q. Did you keep that mixture a long time? *A.* No, but I would most always add more ether if it had been standing a little while.

Q. Did you state that you made this mixture you administered to Mrs. Crie that day? *A.* I had a little in a bottle and I added more to it, before I gave it to her. I had used it a week before.

Q. What is your reason for adding in chloroform to the ether? *A.* Well, I think it is safer. Ether is a great stimulant, and when you have a little chloroform, the patients are not so noisy or excited as they are under pure ether. That is my reason, not that I feared one or the other.

Q. You would not hesitate to give any quantity of chloroform? *A.* No. sir. If amputation was to be performed I had as soon use chloroform as ether.

Q. On the whole, which anæsthetic do you consider the most safe? *A.* I think I should use ether for safety. Ether and chloroform combined, in my idea, is much better than either of them alone.

Q. Do you feel any anxiety when about to administer chloroform or ether or the mixture. *A.* No.

We understand that at the next meeting, Dr. Wood will give the results of his analysis of the anæsthetic, that Mrs. Sawyer will be examined, and that expert testimony on the use of anæsthetics will be heard.

We have said that we should make no comments on the evidence while the investigation is in progress, but we may without indiscretion express our gratification at Dr. Ainsworth's course in giving the affair a thorough and public examination. This should be done in every case of death from anæsthesia.

The coroner's jury in the case of Mrs. Crie met on Nov. 19th and heard the remainder of the evidence. Mrs. Lee, a friend of the deceased, testified that, two days before her death, the latter appeared in excellent health, that she had never known her to complain of trouble in her heart, that she dressed loosely, and was not then nursing her child. Mrs. Sawyer was then called. She repeated very closely Dr. Eastham's account of the events preceding the inhalation, and of such efforts at resuscitation as she witnessed. She thought the deceased was laced very tightyl. She advised her to take gas, because she had herself recovered from it very nicely, and previously had taken ether and felt it for two weeks.

Question. Are you sure it was ether? *Answer.* It was ether and chloroform.

Q. Did Mrs. Crie insist on taking ether, or did she say something about chloroform? *A.* She said ether.

Dr. G. H. B. Flagg is a dentist in Boston. He was in Dr. Eastham's room while Mrs. Crie was dying. He felt her pulse; it was very slow, not more than twenty-five, and feeble, and to him it was apparent that she could not live.

Q. Have you been in the habit of giving chloroform yourself? *A*. No, sir.

Q. Either purely or combined with ether? *A*. Four times in the last ten years I have given a mixture of chloroform and ether.

Dr. Flagg said that he preferred not to give chloroform, but did not know enough about it to say it was dangerous.

Q. Were you in the habit of giving gas to Dr. Eastham's patients? *A*. I usually assisted him.

Q. And he has given ether to your patients? *A*. Four times, sir, during the last ten years.

Q. Then when you stated you had administered chloroform, you meant it had been administered by Dr. Eastham? *A*. Yes, sir.

Q. You knew it was the mixture of chloroform and ether? *A*. Yes, sir.

Dr. H. D. Osgood.—Q. You are a practising dentist? A. Yes, sir.

Q. You were called into Dr. Eastham's office between eleven and twelve o'clock on Monday, Nov. 10th? A. Yes, sir.

Q. Will you state to the jury what you saw there? A. Mrs. Sawyer came into my room at that time and said that Dr. Eastham wanted to see me, for a lady who had taken ether had fainted.

Q. Did she mean ether, or chloroform, or a mixture? A. I don't know; she said ether. I went into his office, and saw a lady in the operating chair.

Q. What was her position? She was inclined forwards. She seemed very low. I examined her pulse, and could not detect any at all.

Q. Did you detect any respiration? A. No, sir, I did not. Examining her clothing, I found she had on corsets,

and that they were quite tightly laced. We applied ammonia and water, and Dr. Eastham slapped her face vigorously with a towel.

Q. Did she at all revive in any way? A. Not to my knowledge.

Q. You could not feel any pulse or detect respiration. Do you think she was dead? A. It was my opinion that she was dead.

Q. That was when you first went in, soon after Mrs. Sawyer called you? A. Yes, sir.

Q. Dr. Osgood, you have been for a long time practising dentistry? A. Yes, sir.

Q. You have been in the habit of giving ether? A. Yes, sir.

Q. Have you been in the habit of giving ether and chloroform? A. Yes, sir.

Q. Do you consider, from the experiences you have had in the use of it, that chloroform is safe, either alone or combined with ether or alcohol? A. I consider it so, or I should not have used it.

Q. Do you give it alone? A. Yes, sir, I have done so many times.

Q. Have you given the mixture? A. Yes, sir.

Q. In what proportions? A. One-third chloroform and two-thirds ether.

Q. Has Dr. Eastham given it for you? A. Yes, sir.

Q. You always knew it was ether and chloroform? A. Yes, sir.

Q. Did the patient know it? A. I could not say.

Q. What did they call for? A. I don't know, sir.

Q. They must have required an anæsthetic or you would not have given it? A. True.

Q. Did they call it an anæsthetic? A. No, sir.

Q. What did they ask for? A. I cannot tell, sir. I think quite likely they called for ether.

Q. Did they ever call for chloroform? A. Yes, sir, very often.

Q. When they called for chloroform, did you give them the mixture? A. I may not have given them either, but gas instead. We never give ether or chloroform when we can get them to inhale gas instead. Sometimes, one demands either ether or chloroform, and then we give it to him.

Q. You give the mixture when they call for the ether or chloroform! A. Yes, sir.

Q. Have you ever seen any ill effects from ether and chloroform mixed? A. No, sir.

Q. The uniform strength has been about one-third chloroform? A. Yes, sir.

Q. By weight? A. No, sir, by bulk. I never considered it a very great matter whether one third, a little more or a little less.

Q. Do you give anæsthetics now as much as you did ten years ago? A. Do you mean ether, and chloroform and nitrous oxide?

Q. Yes. A. I do a great deal more.

Q. Is the use of ether and chloroform on the increase or decrease with you? A. I don't give as much as I formerly did.

Dr. E. S. Wood, acting professor of chemistry at the Harvard Medical School, gave the following account of his analysis:

I received a small glass-stoppered vial containing liquid; a portion of a liver, a spleen and kidney, and the contents of a stomach. The vial contained 1·39 ounces. The odor of the liquid resembled that of ether mixed with chloroform, the odor of chloroform being strongly perceptible. The specific gravity of the fluid=1·043, which corresponds to that of a mixture of six parts by bulk of ether with four of chloroform, if allowance be made for an increase in the density of the two when mixed. A mixture of sixty per cent, of ether with forty of chloroform had a specific gravity of exactly 1·043 at 68 degrees Fahr., and had lost about 1-100 of its volume. A mixture of sixty parts ether with forty

chloroform will not occupy one hundred parts by volume, but only 98·945 parts, and its specific gravity, instead of being 1·032, as if no condensation took place, will be 1·043. The mixture contained no hydrochloric or acetic acids and no chlorine, showing that both the ether and chloroform were free from any deleterious impurity, a small amount of alcohol only existing as an impurity. The liquid answered the tests both for chloroform and ether. By bulk, it was sixty per cent ether, and forty per cent. chloroform, and by weight 58·14 per cent. ether and 41·86 per cent. chloroform. The blood had no odor, either of chloroform or ether, and neither of these liquids was detected by analysis; and the same is true of the organs which were carefully analyzed.

Q. You are somewhat familiar with statistics of anæsthetics, are you not? A. I have seen some statistics.

Q. Have you it in your own power to tell the jury the statistics relative to the mortality occasioned by the use of ether or chloroform, or a mixture of the two? A. The only statistics which I have seen were some which were published in Chicago in 1870, and these were reprinted, or rather copied into the last annual report on the practice of pharmacy and toxicology.

X Q. Will you please state what these were? A. Roughly the proportion of deaths to cases in ether was one in twenty-five thousand; to cases in chloroform, one in twenty-five hundred; to cases of a mixture of chloroform and ether, about one in five thousand.

Q. If you had been handed all the articles, without the chloroform and ether, could you have given any opinion as to the cause of the person's death? A. No, sir.

Q. Did I understand you that there were no odors in the blood? A. Yes, sir. The blood was strongly alkaline.

Q. What do you think is the smallest amount of chloroform that would cause death? A. The smallest reported, as I remember, was from fifteen to twenty drops by inhalation, one drachm taken by the mouth into the stomach, and one drachm of a mixture containing one part chloroform to four of ether by bulk, that is, one teaspoonful.

Q. You mean that dose has caused death? A. Yes, sir, immediately; that is within a few minutes.

Q. Is there any record of the presence of any poison in the blood of any of these cases reported? A. It has sometimes, but rarely, been possible to detect chloroform in the blood. The analysis after death from ether, in case of animals, have been unsatisfactory, and in case of death from chloroform it is only sometimes possible to detect it.

Q. Have you any idea of the cause of absence of congulation in the blood? A. No, sir The spectroscopic examination of the blood gave a normal appearance.

DR. HENRY J. BIGELOW—Q. You have heard the testimony in this case; you have it under oath that this lady had breathed from two to four drachms of a mixture of ether and chloroform such as you have heard stated: now what is your opinion as to the cause of death? A. She died of breathing chloroform; there is no question about it.

Q. You have no doubt that the chloroform which was used in that mixture was the cause of death? A. It was the cause of death.

Q. She took about two-fifths chloroform and three-fifths ether according to bulk; would that amount of ether be sufficient to cause death? A. It would not possibly cause death.

Q. Would it be safe for a child six years old? A. I cannot conceive that it would effect it deleteriously.

Q. Two-fifths chloroform? A. Might kill an adult.

Q. Have you ever in your experience known of any death by chloroform? A. I have been present at but one.

You are familiar with the literature on that subject. From your reading, how many cases are you prepared to answer for? A. I am wholly unable to give a number. They are numbered by hundreds, and it is proved that many are not reported.

Q. Have you ever known of a case of death from ether properly administered? A. No, sir.

Q. Do you, from your own knowledge or by reading,

believe there ever was a case of death from ether properly administered? A. There is a fallacy in the proposition put in that way. Ether is a powerful agent, and if a man is feeble or dying, it would contribute to his death like a dose of opium or anything else that has weight and force and power in it. But that is not the real question as between ether and chloroform, for both of them are powerful agents. The real question is, has chloroform, besides this narcotic power, some very poisonous influence which acts upon the system and in which it differs from ether; has chloroform such a power, has ether, or have both? I answer, chloroform has and ether has not; chloroform kills suddenly and ether cannot.

Dr. S. Cabot.—Q. As a result of your experiences, do you think it dangerous in any way to give ether by inhalation? A. I don't, sir, with, of course, proper precautions.

Q. From your knowledge and personal experience, do you consider it safe to give chloroform? A. No, sir, I do not.

Q. Even properly; with all precautions possible to be taken? A. I don't think it safe.

Q. Judging from your knowledge, what do you think caused the death of Mrs. Crie? A. Inhalation of chloroform.

Q. Do you think that two-fifths of a tablespoonful of chloroform, as taken by bulk, would be sufficient to produce that effect? A. I do, sir.

Q. In your judgment, can a person in ordinary good health take ether to produce death, say in the course of ten or fifteen minutes? A. No, sir.

Drs. Henry G. Clark, George H. Gay and R. M. Hodges testified to the same effect. On the next evening, the jury met again, and presented the following verdict:—

That Mary F. Crie came to her death on Monday, the 10th day of November, 1873, between eleven A. M. and one P. M., in the office of Dr. Charles Eastham, a dentist, No. 25 Tremont street, Boston, and that her death was caused by the inhalation of chloroform administered in a mixture of chloroform and ether by the said Dr. Eastham.

The jury use this opportunity to caution the public against the inhalation of so dangerous an agent as chloroform for the production of insensibility to pain. In the opinion of the jury the inhalation of sulphuric ether is safe, while the inhalation of chloroform, either alone or mixed, is always attended with danger.

It was signed by Ezra Palmer, M. D., John A. Lamson, M. D., Geo. Fabyan, M. D., George Lotz, M. D., Thomas Restieaux and Thomas Doliver.

This case has attracted much attention, not only from the attempt made just after the accident to pass the death off as one from ether, but also, when it became evident that it was due to chloroform, from anxiety to see what would be the conclusions of a Boston jury. The verdict is all that could be desired, as it expresses emphatically the feeling of the profession, and we do not find fault that Dr. Eastham was spared the well-deserved censure which he must have expected. The misfortunes of the past should be remembered only as warnings for the future. The use of chloroform is least justifiable where ether is best known; there is less excuse for its use in America than in Europe, and least of all in this city. After this verdict, nothing but very exceptional circumstances will warrant its administration. It appears in the evidence that several dentists are in the habit of giving whichever anæsthetic they see fit, regardless of the request of the patient. We hope that this custom is not general, and would advise any who may persist in it not to be too sure that after another patient, who shall have asked for ether, has been killed by chloroform, the verdict may not contain, besides other disagreeable words, the adjective "criminal."

ARTICLE III.

Oral Surgery.

The *Philadelphia Medical Times*, in its issue of November 1st, taking the editorial of the October number of the *Dental Cosmos* for a text, discusses the question whether

Oral Surgery is sufficiently distinct and of sufficient magnitude to be worthy of rank as a specialty of medicine. Admitting specialism to be a necessary outgrowth of the extension of medical science and art, the writer recognizes the danger of carrying it too far,—of dividing up too finely. He then considers the true position of dentistry and of dentists, claiming that the great bulk of the work to be done is purely *mechanical*, and therefore the mass of the profession must spend their lives in a monotonous round of purely mechanical labor, in which mechanical and artistic skill along with personal qualities must be the sole guarantees of success; that the higher education and wider culture of the physician is in no sense a necessity to such success; and that dentists as a class have no claims to be recognized as representatives of a branch of the medical profession. He assumes that, because a man may be an excellent doctor without being a dentist, therefore he may be an excellent dentist without being a doctor, and argues that as cancer of the jaw is essentially the same as cancer of the rib, vertebra, or tibia, therefore there is no necessity for oral surgery being a specialty. The writer, however, practically refutes all that he had written in the final admission that he "*would like to see dental schools attached to our medical colleges, and opportunity afforded our medical students to learn something of diseases of the teeth, or even, if they like, to become practical dentists.*" Diseases, forsooth! why, we have just been told that the work of the dentist is purely *mechanical.* Now it seems there are *diseases* of the mouth, which it is desirable medical students should learn something about. That doctors *should* learn something of dental specialism, and that dentists *should* learn more of physiology, pathology and therapeutics, is just exactly that for which we have been contending. That there is abundant room for improvement in both directions, we are well assured; but especially sure that no branch of medicine or surgery is so little comprehended by the general practitioner as that which is assigned to the province of the educational dental specialist. If in

any complex dental lesion, the "mechanical labor" of the dentist, is not sufficient, heaven help the patient who expects to supplement it with the therapeutices of the average family physician! Or, if such complex lesion should first present to the family physician, he would be in an awkward position if compelled to commend him to the care of one whom he had pronounced in no sense entitled to be recognized as a representative of a branch of our profession.

The one word *disease* is a solution of the whole problem; for without a knowledge of anatomy and physiology, how can pathological conditions be intelligently diagnosed; a clear insight obtained into the causes which interfere with normal results or the morbid changes induced by disturbance of physiological processes; and of what use would this knowledge be to one ignorant of therapeutics?

We claim that a hiatus has existed between general medicine and surgery and dentistry; a hiatus not likely to be bridged by general practitioners; that every day there is needless suffering from the lack on their part of the special information which belongs to the province of the dentist. And while patients may not expect from them the manipulative skill which comes only through practice, they are justified in expecting at least an intelligent appreciation of their difficulties. This they are not likely to have while the general practitioner so far fails to recognize dental pathology,—its regional and systemic relations,—as to designate its treatment as "purely mechanical."

The critic of the *Times* finds further argument against oral surgery as a specialty, because "it has no natural boundaries to limit it;" for, says he, "this very day, chancing to be at the clinic" of the lecturer upon oral surgery at the University of Pennsylvania, we saw present three cases, two of which were tumors on the head. What does this prove, except the advantage of such a general medical education as will qualify for the practice of *any* branch? One who makes oral surgery a specialty, need not, if he elect otherwise, decline the treatment of any case. The argu-

ment is only an indorsement of the higher education and wider culture for which we contend.

But let us reverse the picture. "Chancing, this very day," to step in at the house of a medical friend, a general practitioner, we found his wife suffering from an atrocious alveolar abscess, of the pathology and therepeutics of which the doctor was as innocent as a child, and had not recognized the imminent risk of an external disfiguring scar or fistula. This is not an extreme or isolated case. Doctors are proverbially ignorant of the proper treatment of the simplest dental lesions, and we doubt if one in ten can tell the period and order of eruption of the deciduous teeth, or explain the relation of the first molar to the temporary and permanent dentitions. If it be replied that such knowledge ought not to be demanded of the general physician, a fitting answer would be the fable of the dog in the manger. That doctors as a class are not familiar with dental lesions will not be disputed, and the effort to belittle the practice of those to whom they themselves apply when suffering in their own persons from such conditions, is, to say the least, in bad taste.

While therefore we urge a wider range of knowledge upon the dentist, we hail the suggestion that our "medical students be afforded opportunity to learn something of the diseases of the teeth," with great satisfaction; that thus the minds of both may be disabused of the false conception that either may afford to ignore that which belongs to the circle of the other. It is as impossible that any one man should be master of medical science in its details, as it is for him to attain the best possible results in the smallest specialty except by an appreciation of general principles, which underlie equally the practice of medicine and of dentistry.

Dentists are either artisans or medical specialists. If artisans only, they surely are not entitled to recognition as representatives of a branch of the medical profession; and no mechanical skill, however scientific, no artistic culture, however perfect, should be expected to rank for more than

these. If dentistry mean only mechanical and artistic ability, these can be acquired without colleges, and employed without degrees; but if its claim to recognition as a medical specialty is worth *anything*, it is worth *all* it represents.

In the article reviewed, we had distinctly affirmed that the attempt to appropriate the honors of a learned profession on mechanical and artistic ability was simply to court ridicule. With so much of the argument, therefore, as is based on the assertion that knowing how to plug a difficult molar or counterfeit a lost incisor does not entitle to recognition as a specialty of medicine, we heartily agree. We not only admit, but have contended, that mere mechanical and artistic ability does not entitle its possessor to the doctorate, but we deny that a man may be an excellent dentist without being a doctor: we deny that the higher education and wider culture of the physician are in no sense a necessity to the practitioner of dentistry, and demand that he should possess the higher education and wider culture, or lacking them should content himself without a title.

The question is not what dentistry has been, but what oral surgery should be; not what are the qualifications of the majority of those now practicing it, but what is its legitimate province, and what the requirements for its intelligent practice. We see no force in the assumption that because the great bulk of the profession have heretofore spent their lives in a monotonous round of purely mechanical labor, therefore they must continue to do so in the future. We claim that the circle of physiological and pathological sympathies existing between the mouth and every portion of the economy demand first a general medical education, and then special training, that the highest results in treatment may be secured. And as each year witnesses a more thorough educational training, so will the field inevitably widen, until the function of the dentist will be merged into a practice of which that of to-day is but a feeble indication. Who doubts this, let him look at the beginnings of ophthalmology as compared with the practice of that specialty in

modern times. Who could have guessed its present proportions?—nay, who can yet tell its future triumphs?

The mistake of our reviewer consists in ignoring the variety and importance of dental lesions, and in assuming that they can be successfully combated by mechanical labor, —a mistake he would not have been liable to, had he enjoyed the opportunities which he would like to see offered to our medical students. As to the necessity for special schools for any department of medicine, that is a question open for discussion; but a complete medical education having been obtained as a foundation, on this basis the study and practice of any specialty is entitled to the respect and confidence not only of the community, but of all who base their claim to recognition on a like scientific preparation. We claim, therefore, that a dentist having a common education with the general surgeon is entitled to common honor and common privileges with him, and hope to see the day when distinctions because of different fields of labor will be done away.—*Editorial of Dental Cosmos.*

ARTICLE IV.

Vulcanite Litigation.

It will be remembered that it was stated in the November number of the *Dental Cosmos* that a stipulation had been signed between the counsel to complete and try the Massachusetts suit as a test case. We give below a copy of this stipulation.

Under this agreement, the Company having put in their *prima facie* case, the defendant proceeded to put in his proofs and to take testimony in New York and Philadelphia, closing December 17th. The complainants also closed on the 17th of December. The cause has been set for hearing on the 14th of January, before Hon. George F. Shepley, Circuit Judge for the First Circuit.

UNITED STATES CIRCUIT COURT.

DISTRICT OF MASSACHUSETTS.—Goodyear Dental Vulcanite Company and Josiah Bacon, *vs.* Daniel H. Smith.

DISTRICT OF NEW JERSEY.—Same, *vs.* Charles S. Stockton, same *vs.* Frank A. Cummings.

DISTRICT OF DELAWARE.—Same, *vs* Zenas A. Vandeventer.

EASTERN DISTRICT OF PENNSYLVANIA.—Same *vs.* Robert E. Difenderfer. New Suit, Bill filed. Sept, 1873. Same *vs.* William H. Gates, New Suit, Bill filed. Sept, 1873. Same, *vs.* Wm. Harvey Roop. New Suit, Bill filed, Sept. 1873. Same *vs.* George A. Sinclair. New Suit, Bill filed, Sept. 1873.

It is stipulated and agreed that all proofs taken for final hearing in the above entitled suit of Goodyear Dental Vulcanite Company, et al, *vs.* Daniel H. Smith, shall be taken as the proofs for final hearing in each of the above entitled causes, a printed copy of the proofs in said suit taken on behalf of each party, including documentary exhibits, shall be filed with the clerk of the court in each of the above districts within ten days after the proofs are closed on behalf of such party, as the stipulated testimony in the above entitled cause pending in said district, and such testimony shall be read and used at the hearing of each of said causes the same and with the same effect as if the same had been regularly and duly taken in each of said causes separately. Within the same period of ten days, 10 copies of defendant's proofs shall be delivered to Lee & Alvord, of New York, for the use of the complainants, and within the same time, 10 copies of complainant's proofs shall be delivered to Henry Baldwin, Jr., Esq., of Philadelphia, for the use of the defendant. Said suit *vs*, Smith shall be placed on the calendar for the October Term, 1873, and shall be brought to final hearing before the Circuit Judge of the First Circuit at the earliest day that he will appoint, not less than thirty days after the printed proofs on both sides are interchanged as above provided, and at any place within said Circuit that said Judge may designate; the party proposing to apply for such appointment to give reasonable previous notice to the opposite party of the time and place which are proposed in the application to be made for such appointment. None of the causes above entitled shall be brought to hearing on pleadings and proofs, or otherwise, until after the said Smith suit shall have been decided.

All proceedings in said causes shall be had under due notices, to be served only upon and by Lee & Alvord for complainants, and upon and by Henry Baldwin, Jr., for defendants. Said testimony may be taken before Aubrey H. Smith, Esq., of Philadelphia, Kenneth G. White, Esq., of New York, or John G. Stetson, Esq., of Boston, who are hereby agreed upon as Special Examiners for that purpose. It is understood that the printed copies of the proofs already taken by the complainants may be filed and served within ten days after the signing of this stipulation, dated September 30th, 1873.

[Signed]

LEE & ALVORD,
Sol'rs for Compl'ts in suits vs. Smith, Stockton and Cummings.

J. E. SHAW,
Sol'r for Compl'ts in suits vs. Difenderfer, Gates, Roop, and Sinclair.

SAMUEL M. HARRINGTON
Sol'r for Compl'ts in suit vs. Vandeventer.

During the taking of complainants' testimony they issued the annexed subpœna, making the undersigned a witness in the case.

THE PRESIDENT OF THE UNITED STATES OF AMERICA, TO *Samuel S White, Greeting*:

L. S.
U. S. Supb.

We command you, That, all and singular business and excuses being laid aside, you and each of you be and appear in your persons, before John A. Shields, Esq., special examiner in suit hereinafter mentioned, and a Commissioner appointed by the Circuit Court of the United States of America, for the Southern District of New York, in the Second Circuit, at the office of Lee & Alvord, No. 20 Nassau Street, in the city of New York, in the said Southern District of New York, on the 21st day of November, one thousand eight hundred and seventy three, at 4.20 o'clock in the afternoon of the same day, to testify all and singular what you and each of you may know in a certain cause

now depending undetermined in the Circuit Court of the United States for the District of Massachusetts, wherein the Goodyear Dental Vulcanite Company and Josiah Bacon are complainants, and Daniel H. Smith is defendant, on the part of complainants.

And this you or either of you are not to omit, under the penalty upon each and every of you of two hundred and fifty dollars.

Witness, Hon. Nathan Clifford, Associate Justice of the Supreme Court of the United States, at the City of New York, the twenty-first day of November, in the year of our Lord one thousand eight hundred and seventy-three.

[Signed] KENNETH G. WHITE,
Clerk.

As an element of the history of the attempts to embarrass those who regard the Cummings patent invalid, an action has been commenced against the publisher of this Journal, by a writ served upon him Dec. 10th, 1873, of which the following is a copy.

THE PRESIDENT OF THE UNITED STATES OF AMERICA, TO *The Marshall of the Southern District of New York, Greeting:*

We command you, as we have before commanded you, that you take Samuel S. White, of Philadelphia, Pennsylvania, and a citizen of the State of Pennsylvania, defendant, if he shall be found in your district, and him safely keep so that you may have his body before the Judges of the Circuit Court of the United States of America for the Southern District of New York in the second circuit, to be held at the United States Court Buildings, No. 41 Chambers Street, in the City of New York, in the said Southern District, on the first Monday of January, 1874, to answer unto The Goodyear Dental Vulcanite Company, a corporation created by the laws of New York, and a citizen of the State of New York, plaintiff, in a plea of trespass; and also, to a certain bill of the said plaintiff against the said defendant for a plea of trespass on the case to the damage of said plaintiff in the sum of one hundred thousand dollars, according to the custom of the said court, before the said

Judges, then and there to be exhibited, and that you have then and there this writ.

Witness the Honorable Nathan Clifford, Associate Justice of the Supreme Court of the United States, at the city of New York, the third day of December, in the year one thousand eight hundred and seventy-three, and of the Independence of the United States the ninety-eighth.

LEE & ALVORD,
Attorneys.

KENNETH G. WHITE,
Clerk.

We do not know what trespasses we have committed upon any rights of the Company bringing this action, but will doubtless be informed by the specification of their charges when filed.

The further progress of these cases will be duly reported in the *Dental Cosmos.*

SAMUEL S. WHITE.

EDITORIAL, ETC.

Blindness Cured by the Extraction of Diseased Teeth.—Dr. Geo. S. Staples, of Corinth, Mississippi, sends us the following interesting case:

EDITOR JOURNAL.—*Dear Sir*—A case came under my notice some time since, that I have thought might prove of interest to the readers of the *Journal;* but have neglected to report it up to the present time. The case is as follows:

In passing through a neighborhood in the Eastern portion of this State in the spring of 1868, I stopped at a house where I met Mrs. S——, (aged about thirty-five.) She learned that I

was a dentist, and remarked that her teeth were very bad, and that she was anxious to have them extracted, but felt too nervous to do so. I then learned in the course of our conversation that she suffered a great deal from her eyes, and that they continued to grow worse.

I suggested that her teeth were the cause of the trouble with her eyes, (but never having met me before I think she had very little confidence in my judgment;) so she let her teeth remain, her eyes growing worse all the time, until about ten months after I met her she went totally blind, hardly being able to tell day from night. She called on some quack eye doctor, who happened to find her teeth were bad, and who advised her to have them extracted. She sent for me and had all her teeth extracted that were affected. She commenced immediately to recover her sight, and in a short time it was nearly as good as it ever was, and continues so up to the present time.

Metallic Enamel.—Dr. Blake, of San Francisco, professes to have discovered a method by which the crowns of teeth lost by abrasion, fracture, &c., can be restored by what is termed a metallic enamel, which is so shaded as to blend with the natural color of the tooth ; it is described as follows :

Of late years the desire among dentists has been to save teeth by filling, not only when decay has taken place, but also in the case of persons of mature age, when the enamel or grinding surfaces are entirely worn off. In such instances the dentine or bony structure soon shows wear, and in a comparative short time there is not much of a tooth left above the gums. This is a source of annoyance to persons in such condition. A few years ago, when a patient's teeth were worn down or broken off, recourse was had to a metallic or rubber plate, after the bad teeth had been extracted. These plates are always more or less uncomfortable and quite expensive. Now, the art of dentistry is so perfected that the teeth can be built up, or capped with gold, giving to the patient many more years' use of his natural teeth than by the old method of substitution, or employing artificial teeth.

In front fillings, where the tooth is thus built up to its natural shape, the gold must necessarily be conspicuous, and many per-

sons naturally object to this prominent exhibition of shining gold. This objectian, however, is now overcome entirely by the invention of Dr. Chas. E. Blake, which consists of a metallic enamel, so shading the natural color of the gold, that the bright yellow luster of the metal is changed or toned down, so as to blend with the color of the tooth. This process can be performed after the tooth has already been filled in the ordinary manner with gold. The coloring material can be inserted with the gold, and when finished, the blending together of the two metals skilfully will give any desired shade to the filling. to correspond with the color of any particular tooth. Of its durability there can be no doubt, as the material used is platinum, a white and pure metal.

No great amount of skill is required to produce a desirable shade by the alternate use of the two metals, one white and the other yellow. Gold foil is not used. Very thin plates of gold and platinum, alternating, are used and thoroughly incorporated together in filling. The platinum is plated with a thin covering of gold, so as to make it adhere closely. It is prepared in sheets from the pure metal. The finished surface is perfectly hard and solid, giving a grinding face to the tooth, which is very durable.

The Dental Rubber Cases—A Novel Law Suit.—From the *N. Y. Herald* we take the following, to which reference is made in the selected article in the present No. of the *Journal:*

The Goodyear Dental Vulcanite Company, owners of the patent for hard rubber plates for artificial teeth, have just instituted a suit in the United States Circuit Court, in this city, against Samuel S. White, of Philadelphia, laying their damages at $100,000, the alleged offence complained of being what is known in law as "maintenance," which is defined in the books as "intermeddling in a suit that no way belongs to one by maintaining or assisting either party with money or otherwise to prosecute or defend it."

Mr. White is an extensive manufacturer of materials, which are purchased by dentists for their practice. The dentists are opposed to the payment of royalties to the company, which owns the patent, and it is alleged that Mr. White prepared defences which, it is claimed, he supposes the dentists might make against

the Company when called on to pay for their license; that he voluntarily furnished at his own expense such defences, in a printed form, to the licensees of the Company and to others, and that he payed the defendants' expenses of law suits instituted by the Company against those who have followed his advice. The Company claim, that their losses by the alleged interference of Mr. White are not less than $100,000.

The other side remains to be heard, and when Mr. White's answer has been put in it will be duly noted.

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MONTHLY SUMMARY.

Listening with the Teeth.—Listening with your teeth may seem a comical action, but it is a possible one, and after all, no more unnatural than that of talking with the fingers, which every educated mute can perform. Any one who will hold a vibrating tuning-fork to his dentals will be struck with the sonorous thrill that goes through his head, and the superior intensity of the sound compared to what is experienced when the fork is held to the ear.

That other nerves than those appointed for audition are capable of conveying sound vibrations to the brain, is thus pretty evident. We had remarked this so often that we were fully prepared to give credence to a statement made by a newspaper correspondent, to the effect that a deaf friend was stirred with delight at the music of a violin, rendered audible to him first by placing the instrument between his teeth while it was played upon, and afterwards by means of a string tied to the violin, one end of which was held in the deaf man's mouth. The writer in question suggests a repetition of his experiment upon a larger scale, with a number of strings stretched from an orchestral sounding-board to the mouths of a deaf audience. A concert of such character might be a ludicrous affair to sharp-eared spectators, but we venture to think with the proposer, that the experiment would be far more gratifying than absurd to those who, for the first time in their lives, were thus moved by concord of sweet sounds. Let us hope that curiosity, if nothing else will prompt a fair trial by those who have charge of the deaf in our asylums.

As our inventive times go, we ought not to be backward in attacking any problem for the alleviation of bodily suffering or the restoration of natural deformations. We make the lame walk, and the toothless bite. We have even made the blind to see; for lately a Venetian surgeon succeeded in restoring the lost vision of a man whose case had been abandoned as incurable. —*Ex. Druggists Circular.*

The Prevention of Loss of Blood.—The *Medical Times and Gazette* recommends the following plan to diminish the loss of blood in operations:—

An elastic bandage, about two inches and a half in width and from five to ten yards long, is firmly bound round the limb, commencing at the toes or fingers, as the case may be, and is then continued upwards so as to drive the blood before it out of the veins and arteries. When the desired point has been reached, a strong india-rubber band, about half an inch in diameter, is tightly drawn two or three times round the limb, just above the elastic bandage, and fastened by hooks. The bandage is then removed, leaving the tissues blanched and ensanguined. Not a particle of blood is lost during the operation, which is really more bloodless than when performed on the dead subject. After the operation is completed the rubber rope is removed, and the blood then finds its way into the vessels, which are ligatured or twisted according to the taste or inclination of the surgeon. On this plan, which has been carried out at St. Thomas', Guy's, London, and St. Bartholomew's Hospitals, many operations have now been performed, including excision of the knee and elbow joints, amputations, and the removal of dead bone; and Mr. Wagstaffe has recently amputated through the thigh for gangrene of the foot on this plan, the precaution having been taken to commence the application of the elastic bandage several inches above the mortified part. No ill effects of any kind have hitherto been observed from the use of this contrivance. Although the duration of the operations has varied from a few minutes up to half an hour, and even more, during the whole of which time the circulation has been completely arrested, no evidence has been afforded of the formation of emboli or thrombi in any of the cases. But it is one of the possible evils of the device that the prolonged pressure on the vessels and complete stoppage of circulation may, under certain conditions, lead to the formation of a clot, which, on the re-establishment of circulation, may be carried along the vessels, and arrested in some part of their course, giving rise to circumscribed inflammation or even gangrene. There is also considerable danger in applying the bandage over parts which are inflamed and suppurating, especially if decomposition be going on, lest some

of the clots which are found in the blood-vessels of the affected parts be detached and forced into the blood current. For such cases it would be well to employ in addition a modification of the plan which has been practiced at Edinburgh for the last two or three years, and which consists in suspending the limb for some minutes before the operation, so that the blood may gravitate downwards. Then the bandage may be applied at the proximal side of the diseased part, thus avoiding all risks of septic poisoning or of embolism.

Mercury in the System.—Prof. Hyatt delivered a lecture on mercury, in Vienna recently, when he exhibited the leg-bone of a man whose death had undoubtedly been hastened by mercury. On striking the bone heavily upon the table, out fell thousands of little glittering globules of mercury—bright metalic mercury —which rolled about upon the black surface before him, collecting here and there into drops. This mercury had been absorbed during life, undermined the man's system, and proved fatal to him. The mortality among those who work in mines of quicksilver, or in the works where it is reduced, is known to be frightful. In the celebrated mines of Idria, the men work alternately one month in the mines and one month in the smelting-house. But notwithstanding this, it appears that of the hundreds employed there, one-fourth become salivated.—*Am. Chemist.*

Lead Poisoning through Drinking Water.—M. Leblanc, of Paris, has been examining water conveyed through leaden pipes. He tested five litres of such water condensed by evaporation, and the most sensitive re-agents failed to detect it in the presence of any salts of lead. He states that lead is readily affected by distilled water, the result being carbonate of lead, which renders the water milky; but the presence of an infinitely small quantity of carbonate of lime is sufficient to remove from the water its action on the lead. Even rain-water, which absorbs lime from the atmosphere, or that which it meets with on the roofs of houses, contains a sufficient quantity of that substance to render lead unattackable. This would explain why leaden pipes last almost indefinitely without being deteriorated, whereas iron and other metalic pipes are rendered completely useless in the course of a few years, from being corroded and pierced through.—*Med. and Surg. Reporter.*

Hope for the Bald.—A writer to an English exchange gives the following case, which will be read with interest by that large class of gentlemen whose hair is thin, but not from years :—

A gentleman, who had lost nearly all his hair after a very severe attack of fever, consulted a French physician of great reputed success as a hair restorer. The prescription was a drachm of the homœopathic tincture of phosphorus to one ounce of castor oil; the bare spot to be rubbed with this mixture three times weekly for half an hour each time, after the skin of the head had been thoroughly cleansed with warm water without soap. This treatment was faithfully carried out for about six months; the hair soon began to grow, and in a year from the time of first following the doctor's advice, his head was as thoroughly covered as ever, the new crop of hair being about two shades darker than the old.—*Med. and Surg. Reporter.*

Modification of the Operation for Harelip.—On two successive Saturdays Sir William Fergusson has recently demonstrated to the student of King's College, London, a model modification of the ordinary operation for hare-lip. The cases in which he carried out this plan were of the usual type, the fissure being as in the majority of instances, on the left side; and in both it was considered advisable to take away the intermaxillary bone. This adds to the success of the operation, not only by removing an occasional obstacle to primary union, but because the teeth, which are subsequently developed from the protecting knob, are worse than useless, by reason of their deficient development and faulty position. Instead, however, of removing the portion of bone readily with the knife or bone forceps, it had occurred to Sir William that it would be much better to operate subcutaneosly, so to speak, by stripping off and retaining the mucous membrane; and accordingly this was done, with perfect success, the bone shelling out readily from its investment. Not only will this procedure greatly accelerate the subsequent process of healing, but the advantage is obvious, of retaining a thick and firm mucous surface in preference to the more artificial substitute of cicatricial tissue.—*Brit. Med. Journal.*

Bad Tea.—The question of spurious or injurious tea seems to be growing important. The Chinese have discovered that the tea-leaves mixed with dung, iron filings and other substances, all powdered fine, suits the English market, and are sending compounds of that sort over in huge masses, of course not without connivance from some English dealers on this side. On Tuesday, it was alleged by the Sanitary Commissioners of the city (London) that no less than 10,000,000 pounds of such tea, totally unfit for human food, was in bond ready for sale. The quantity would, we believe, be greatly increased if partially adulterated tea were added to the list.—*Spectator.*

Facial Paralysis.—An interesting illustration of this common malady was noticed in a man above 45 years of age. No cause could be found for the occurrence of the lesion. The man awoke in the morning and found his face distorted. Upon close examination it was found that there was loss of smell upon the same side of the nose with the paralysis, and also loss of taste upon one half of the tongue upon the same side, thus enabling his medical attendants to arrive at quite definite conclusions with regard to the seat of the lesion.

There was some tenderness over the mastoid region, along the course of the nerve. Iodide of potassium, leeches, and electricity form the main features of treatment. In some of these cases the constant current will act, and the primary current will not; but in this case the constant current would not act, but the primary current would.—*Bellevue Hospital Report in Medical Record.*

On the Surgical Use of Gastric Juice in the Treatment of Cancerous Tumors.—Professor Lussana, after several years of experiments and observations, has arrived at the following conclusion: 1. Gastric juice applied to these tumors softens their tissues, but its action is not powerful enough to arrest the progress of the disease. 2. That natural gastric juice is more reliable than the artificial. 3. It does not destroy the vascular tunics, but arrests local hemorrhage produced by the destruction of tissues. 4. The gastric juice of dogs was found to act slowly; indeed, it did not much retard the development of the tumor. 5. There is a continuous exhaustive loss of substance during treatment, and it is probable that through the cancerous elements are dissolved by this remedy, the further extension of the disease is not prevented.—*Gion. Ven. di Sci. Med.*

Test for Impurities in Water.—An English technical periodical says, "Good water should be free from color, unpleasant odor and taste, and should quickly afford a lather with a small portion of soap. If half a pint of water be placed in a perfectly clean, colorless glass-stoppered bottle, a few grains of the best lump white sugar added, and the bottle freely exposed to the daylight in the window of a warm room, the liquid should not become turbid, even after exposure for a week or ten days. If the water become turbid, it is open to the grave suspicion of sewerage-contamination; but if it remains clear, it is almost certainly safe. We owe to Heisch this simple valuable, but hitherto strangely neglected test."—*Medical Times.*

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ARTICLE I.

The Larynx the Source of the Vowel Sounds.—Continued.

BY THOMAS BRIAN GUNNING, NEW YORK.

The opinion is generally entertained that the larynx rises and falls with the pitch of the tone; that is, that it rises in singing from the lowest tone of the voice, *through the whole scale*, up to the highest, and falls with the tones in descending the scale. This error has no doubt arisen from the fact that, in a few of the lowest notes, the larynx falls, and in a few of the highest it rises; and the custom of using certain consonants in connection with different vowel sounds in vocal exercises has, by complicating the action of the parts, made the discovery of the truth a matter of extrême difficulty. But by singing up and down, through the scale of the voice, and using only *one* vowel sound, *without a consonant*, it will be found that there is an octave or more in the scale, in which the larynx neither falls nor rises, and that its movements down and up are all below and above that part of the scale; and this part of the scale is that in which we usually speak; and it will differ in pitch according to the voice.

Now, with the fingers and thumb upon the larynx, while sounding the *different* vowels upon any one tone within the speaking scale, whether in speaking or singing voice, it will be found that the relative positions of the hyoid bone and larynx change with *every* alteration of the vowel sound. In using the vowel sounds, a, e, i, o, u, pronounced *ah*, *a*, *ee*, *o*, *oo*, the larynx rises but little in *ah*; more in *a*; in which the hyoid bone also moves toward the chin; but in *ee* the thyroid cartilage is drawn up very close to the hyoid bone, which last is also drawn *much* nearer to the chin than in *a*; in sounding *o*, the larynx does not rise at all, but the membrane between it and the hyoid bone tightens, the bone descends some, and goes forward; in *oo*, the larynx rises much, the membrane is very tight, and the bone drawn forcibly forward. The English vowels can be formed only by different positions of the hyoid bone and larynx relatively to each other, and this is true of every possible modification of vowel sounds, and even in the whispering voice. By sounding any one consonant with the different vowels, and making allowance for the movement of the hyoid bone in carrying the tongue up, as in *k*, or *t*, it may be felt that the same relative changes are made for each particular vowel sound as without any consonant. In fact, this is so in all cases, whether initial or terminal consonants are used, and under any circumstances in which vocal tone is heard, for no tone is uttered except with some modification of vowel quality. Not only the nasals, and others, termed semi-vowels, but even the consonants except in their beginning or ending, and when initial or terminal (in which cases the contact of the parts above the epiglottis gives them distinctive characters,) except also, perhaps, in their sibilation and buzzing, are, as shown by the movemements in the hyoid bone, thyroid cartilage, and the membrane between them, vowel sounds, derived from the larynx.

In analyzing these movements, a striking resemblance in them is discovered in forming the highest and lowest vowel sounds. These are *i*, (sounded as ee in eel,) and *u*, (oo as

in boot.) The difference is, that in the first, the hyoid bone and the thyroid cartilage are a little closer together, and the membrane perhaps rather tighter than in the other, while the hyoid bone is a little lower in *u*. In both, the hyoid bone is forcibly drawn toward the chin, with no perceptible difference, unless it be more forward in *u*. These vowels therefore afford the best opportunity for judging how the cavity of the mouth, and the organs within it, affect the tones of the vocal chords, and the sounds which pass the epiglottis; for the special qualities of these vowels are certainly the two extremes in pitch, not only according to Helmholtz, Merkel, Donders, and others, but as proved by Mr. Willis, whose opinions are entitled to the highest consideration. I shall therefore, in explaining the movements within the mouth and their effects, use the vowels according to the pitch of their special acoustic qualities. This will place them in the following order: *i*, *e*, *a*, *o*, *u*.

The lips, so prominently seen in speech, and which, like all the parts *within* the mouth, contribute to its perfect utterance, do not give any portion of the vowel quality to any vowel, except so far as they may be considered to do so by appropriately changing to give the vocal sound *as a whole*, a suitable outlet. In speaking the lower lip is specially active in movements appropriate to the labial consonants; but good vowels may be uttered while the lips are held wide apart, and in singing perfect vowels are heard while the lips are held far apart to give a proper quality, and outlet to the higher tones. Neither the cheeks, by their lining membrane and muscles; nor the muscles and the membrane which extend back to the centre of the pharynx, and control the size of the oral cavity, so far as proper tension can effect it, (although both, therefore, exert important influence upon each tone as a whole,) nor the tonsils which vary so much in size, contribute anything to the vowel qualities. The soft palate is important to the vowel sounds only in closing the entrance to the nose with suitable tension. The hard palate, and the gum and teeth of both jaws are important for their

influence on, and their transmission of the voice as a whole; but all these are so different in different persons, and in the same individual at different times, that if the vowel sounds depended upon them for their special characters, speech could rarely be perfect, and would be at best so insecure, and so often lost, as to be of no general use. The vowel sounds may be perfectly and easily formed, even when the *rugæ* on the upper gum, extending up toward the roof of the mouth, are covered with a hard plate which presents a smooth polished surface to the tongue. The flexibility of the tongue, and its activity in speech, are so great that it is extremely difficult to define strictly what it does, and what it does not do, in articulation. It has been already shown that, after its loss, the vowels are perfectly enunciated, but the fact remains that the tongue when present, and in good condition, moves actively in the changes from one vowel sound to another, not only in speaking and whispering, but also in singing. In speaking and whispering the vowel *i* (ee,) the point of the tongue is down against the gum and inside of the lower front teeth, its centre rounding nearly up to the front of the hard palate. Now, if the finger is pushed up over the tongue, and curved suddenly down, it will be found that the tongue is pulled forward extremely at the centre of its base, but curving back on each side, while the epiglottis which is also drawn forward, leaving the aperture of the larynx wide open, is so far from the tongue that the end of the finger can go down between them. In *e* (a,) the tongue is lower in its centre, leaving a larger opening above, its base with the epiglottis being further back than in *i*, while they are also closer together. In *a* (ah,) the tongue is higher behind, its base further back, and close against the epiglottis, and both, also, nearer the back of the pharynx.

In *o*, the tongue is still higher behind, while its base with the epiglottis is so far back that the finger in examination presses the pharynx so much that it is difficult to bear. In *u* (oo,) these positions of the tongue up back, and down

against the epiglottis, are so extreme that prolonged examination with the finger is unendurable. In *singing* the two higher vowels *i* and *e*, the tongue is not so close to the front of the hard palate, as in *speaking* them; in singing the three lower vowels, the tongue is about as near to the back of the palate as in speaking and whispering. The tongue does not seem to alter its position, in singing, between high and low tones, except *in the notes above and below the speaking scale of the voice*

In these movements to form the vowels, the parts above the epiglottis are so arranged that brief explanation will clearly show that they do not act for the addition of the vowel qualities to the tones of the vocal chords, to any considerable extent, except in assisting to have this addition made below the epiglottis, or at the aperture of the larynx which it modifies. In sounding *i* (ee,) the cavity of the mouth is larger, compared with the outlet between the tongue and the front of the hard palate, than in the other vowels, whose overtones are lower. This, as shown previously, is contrary to the acoustic law which governs resonance, which is, that to exalt or strengthen acute tones, the resonant cavity must be smaller in proportion to its outlet, than in grave tones. The same inconsistency exists as to the other vowels, for the examination of the parts within the mouth, which I have before made, proves that the positions taken by the tongue, within the cavity of the mouth, during the utterance of the other vowels, make the outlet between the palate just behind the upper front teeth and the tongue below it, larger, and the cavity within, smaller, as the overtones which characterize the vowels lower in pitch. This shows that the cavity of the mouth, with the tongue and other parts within, do not act to add the vowel qualities to the tones of the vocal chords, during their passage through the mouth. The movements of the tongue, however, in assisting and complementing the epiglottis, show that it acts, in strict accordance with acoustic law, in concert with the epiglottis, to form the vowel

qualities before their entrance into the cavity of the mouth, for, in the vowel *i* (ee,) the epiglottis is drawn so far forward that the resounding portion of the upper cavity of the larynx is shortened, and the aperture very widely opened, and, as the vowels, which are qualified by the re-enforcement of the graver overtones of the vocal chords, are sounded the epiglottis, by going back, and shutting down, not only increases the length of the upper cavity of the larynx, but also lessens the size of its outlet. In these movements it acts in concert with the hyoid bone and thyroid cartilage, previously explained, and it was seen that they are drawn forcibly forward in *i* (ee,) and in *u* (oo,) and these vowels include the two extremes of the vowel qualities.

By this co operation a short resonant cavity, with a large and clear outlet, is gained to re-enforce the high overtones of *i* (ee,) and a long cavity with small outlet is produced, opening nearly against the back of the pharynx to do the same for the low tone of *u* (oo.)

Prof. Tyndall's experiments with a tuning fork, held at the entrance of his mouth, are not only unreliable, but necessarily incorrect. The difficulty most apparent when the tuning fork is used, is to adjust the tongue, lips, &c., so that the cavity of the mouth will resound without their taking the true adjustment from life long habit. The vowel corresponding to the fork being known, this disposition of the vocal organs to assume the positions necessary for its production in speech becomes, in this experiment, almost if not quite unavoidable. He says that after adjusting the cavity of his mouth so that it resounds forcibly to the fork, he obtains the vowel sound without altering in the least the shape or size of his mouth. But it is a mistake to suppose that only the cavity of his mouth resounded, for the upper cavity of the larynx was in communication with it, and any resonance obtained included that of all the space down to the vocal chords. I adopted Prof. Tyndall's own method of holding the fork at the outside or entrance to the resonant cavity, but used bottles, jars, and tubes in the experiments

detailed above, to show that the vowel qualities are not formed in the mouth. But these fixed cavities, reliable as they are and useful for this purpose, do not, however, meet all the acoustic points involved in speech; nor is this done even in Mr. Willis' experiments with the reed and adjustable pipe, although they are so free from any liability to error, that his results are demonstrations. But these experiments do involve principles having important bearings upon the whole matter.

The human voice, formed by the vibrations of the vocal chords is, from its commencement in the larynx to its exit at the lips, subject to modification in and from the vocal tube. Although, as shown, the vowel sounds do not originate in the mouth, this cavity and the organs within and around it do effect them, and it is because of this influence and modification no doubt, that Mr. Bishop, Prof. Tyndall, and all who have treated of speech, have been misled as to their source. I purpose to show very briefly now how these parts exert their influence, and conform in their action to the demonstration already made that the *larynx* is the source of the vowel sonnds. This will be done without leading the reader deeply into a consideration of cataphonics, the examination of the acoustic features of speech not being the object of this paper.

Examination of the movements of the tongue in sounding the vowels in the order or pitch of their special qualities shows that in the vowel *a* (ah,) the tongue, like the thyroid cartilage, remains virtually still; that as the vowel qualities ascend in pitch, the tongue rises toward the front, and leaves a larger cavity behind; and that, on the contrary, as the vowel qualities descend in pitch, the tongue rises higher behind and enlarges the cavity in front. By these movements little change is made in the size of the mouth cavity; the great alteration is, that in the vowels having the higher quality the resonant cavity of the mouth is shut in behind the tongue, while in those having the lower quality, the tongue rises behind, and the resonant cavity is in front.

The base of the tongue is seen to be close against the epiglottis in *a* (ah.) This thin fibro-cartilaginous cover to the aperture of the larynx is thus steadied, and this assistance of the tongue is also given to the epiglottis in all the sounds whose vowel qualities are of lower pitch. In those vowels, on the other hand, whose overtones are higher than in *a* (ah,) the tongue leaves the epiglottis free. By this the elasticity of the epiglottis, and its smooth inclined surfaces assist in forming the higher vowel qualities. In sounding *i* (ee,) it has been shown that the tongue while thus drawn forward at its base, also rises so abruptly that its centre is near the roof of the mouth, leaving only a very small outlet; and, as the *point* of the tongue is at the same time down behind the lower front teeth, its rounded surface is close to the projecting and mobile *rugæ*, so prominent in the palate where it curves up backward from inside the upper front teeth. By this the reflections from the uneven and mobile surfaces, restore the quality of the laryngeal sound, which would otherwise remain so effected by the large resonant cavity of the mouth, that it would not yield the pure sound of *ee* at the lips without extreme action of the parts entering into the formation of the upper cavity of the larynx. The lips are of less importance for *ee* than any other vowel. In hissing or sibilation, as heard in sounding *s*, the larynx merely rises with the hyoid bone to allow the tongue to reach the palate. It is seen that in the vowels whose qualities are low in pitch the tongue rises behind, and leaves the resonant cavity open in front. Thus in using the vowel *u* (oo,) in speech, especially in low tones, the lips are important to assist and give a proper outlet to the sound. When the lips are imperfect more change is necessary in the positions of the parts forming the upper cavity of the larynx. The change is easily detected by holding the fingers upon the front of the thyroid cartilage and sounding this vowel, first as it is usually spoken, and then with the lips widely opened.

The lips usually make a somewhat rounder outlet for *o*, and *oo*, than for *ee*. It is also probable that the back of

the tongue and the pharynx which it lies so high against in *o* and *oo*, conform their outlet for these vowels to that at the lips. In whispering the same changes are made by the organs above the inferior vocal chords, as in speaking, but the expulsive power of the chest is weaker. In singing, however, the lips are frequently quite wide apart, and in singing *i* (ee,) in addition to this, the tongue is never so near the roof of the mouth as in speaking, and yet within the medium scale of the voice the vowel sounds are well formed.

By these and former observations throughout this paper, it appears that the upper cavity of the larynx not only forms the vowel sounds in the first instance, but also continues to keep them perfect in the many different conditions and positions of the lips, tongue, and other parts above the epiglottis. This is confirmed by using any vowel sound in connection with and followed by the nasals *m* or *n*. It will then be found that the vowel sound is ennunciated perfectly, although associated with the buzzing consequent upon the vibration of the nostrils, and also affected by the peculiar resonance of the cavity itself. When the nasal *m* or *n* precedes the vowel, the soft palate frequently shuts off the nose at the commencement of the vowel sound, which is then heard through the lips only, and therefore free from any influence of the nasal cavity or the nostrils.

In the vowel sounds which pass through the nose the influence of the lips, tongue and cavity of the mouth is very limited, but since the larynx is active the sounds are easily distinguished.

It has been recently shown by Mme. Seiler that the female voice has only a few tones more than an octave in which all the vowels can be distinctly sung, and it has been long known that the vowel *u* (oo in boot,) cannot be sounded by some soprano singers on the highest notes of the voice, even where *i* (ee,) is possible. There is, therefore, a more limited range to the vowel sounds than to the tone of the voice. This is owing, no doubt, to the fact that in the high-

est notes the hyoid bone is drawn so *forcibly* forward, and the membrane attached to it is made so tense, that no change can be made in its relation to the thyroid cartilage. The relative position of the hyoid bone is more forward for *oo* than *ee*, while the epiglottis is farther back in *oo*, and perhaps too near the back of the pharynx for the sound to escape. The limit of the power to form the vowel sounds appears to be reached only with that of the ability to change the form of the upper cavity of the larynx.

Up to this point the only reference made to the false vocal chords was the statement, after telling that the true chords, the originators of voice, were attached to the inside of the thyroid cartilage a little above the membrane felt as a notch in front of the neck, that "the false vocal chords are close above." The position and relation of these two pairs of vocal chords are very peculiar. The true or inferior chord passes back from the thyroid cartilage to the extreme end of the projecting point of the *arytenoid cartilage*, while the false or superior chord is attached above, on the receding front of the *arytenoid cartilage.* Between these chords, on each side of the larynx, the narrow slit, known as the ventricle, gives entrance at its anterior part to the membranous sac, situated between the superior vocal chord and the inner surface of the thyroid cartilage, and extending up frequently to its superior border. The investigation into the physiological action of the larynx in voice, aided by the laryngoscope, first used for this purpose by Garcia in 1855, and by others since then,—especially by Mme. Seiler when assisting Prof. Helmholtz in his investigation of the vowel tones and the registers of the female voice, as shown in her book, Philadelphia, 1870—have resulted in the opinion that the superior vocal chords exert little influence upon voice or speech. Researches, however, which left the movements of the upper cavity of the larynx in articulation undiscovered, would naturally fail to discover anything relating to the vowel sounds in the movements of the upper borders of the ventricles.

In view, however, of the fact that alteration of the inferior vocal chords cannot be made without affecting the chords close above, and of the peculiar activity in the upper cavity of the larynx during vowel sounds, together with the further fact that, in singing, the cavity of the mouth, and the surrounding organs are engaged in giving expression more to the vocal tones, than to the vowel sounds, I infer that the upper vocal chords, the ventricles, and their associated sacs, assist in forming the vowel qualities, at least, when the other parts of the apparatus of speech are specially active in vocal expression. It is also probable that, even in speech, the vowels having the higher qualities are in part formed by them. My own observations and experiments with the natural organs, and by other means, indicate that they are. But this subject may shortly be better understood; for a laryngoscope might be arranged with a double tube to fit into the roof of the mouth, over the tongue, so that the superior vocal chords in the vowel sound *ee* could be observed through one tube, proper light being thrown in through the other.

It is probable that in very few cases has the *whole* of the tongue been lost. If any is left in front of the epiglottis, it is to be expected that it would be more on the sides where the tongue goes further back, and where the muscles, which pass down from the styloid processes, enter it, and these muscles would therefore still remain to draw any portion of the tongue back. That some part does remain in front of the epiglottis in every case in which speech is left at all perfect seems probable. In cases where it has been taken away for punishment it is hardly possible that, unskillful as the executioners must be, they could get at the tongue very low down. In the case of Robert Rawlings the whole tongue was, it is said, removed because of cancer, by Mr. Nunneley in 1861, and the patient spoke well shortly after the operation. The Hon. Edward Twistleton reports and remarks upon this case very fully in his work, "The Tongue not Essential to Speech," London, 1873. At his request Raw-

lings submitted his month to Sir Charles Lyell, Dr. Milman, Professors Huxley, Owen and Faraday. The letters *t* and *d* could not be pronounced as, to form them, the tongue goes up to the gum just inside the upper front teeth, but the speech was on the whole good. It does not appear in this case that the epiglottis was seen by any of the gentlemen who examined the mouth. This silence in regard to so important a point indicates that some of the tongue yet covered the epiglottis. Judging from Professor Huxley's statement, enough of the tongue remained to give attachment to the muscles which draw the tongue back, and probably sufficient to pad the epiglottis, and hold it steady under the vibration of the low tones. Certainly there was none that could in the least affect the resonance of the mouth. If, in any case, the epiglottis were left entirely exposed, it is not likely that the speech would be as perfect as in Rawling's case. The movements made by the base of the tongue in the vowel sounds are merely like those of the epiglottis, which it complements. In addition to this its body and point aid in forming the consonants, except those formed by the lips, or by the lower lip and the upper teeth. Its movements in the mouth are regulated so as not to interfere with its relations to the epiglottis or alter the vowel quality, and in some sounds perhaps, it even assists in keeping them perfect in disadvantageous conditions of the mouth cavity. It is not surprising, therefore, that it should long be supposed that speech was more dependent upon the tongue than it really is: but notwithstanding the very great importance attached to it in regard to its participation in speech, the fact that the tongue is the *superior epiglottis* has never before been shown, nor, so far as I know, ever suspected. With this in view, it is seen how the epiglottis itself can be injured or lost, and a fair capability of speech remain. Intelligible speech is also possible after loss of the tongue, if the epiglottis is intact, so that the usefulness of the larynx is doubly secured.

The larynx is also protected by the projecting lower jaw. This bone, moved by muscles attached to its upper termina-

tion (in a line with the opening of the ear,) gives a base of support by its lower part) to the muscles of the hyoid bone and tongue, enabling them to act efficiently in vocalization and articulation. This control of the lower jaw at its upper extremities in man, so different from that of the lower animals, is associated with a marked peculiarity in the human hyoid bone. The ends of the hyoid bone in the dog, the sheep, the deer and other animals articulate "close," that is, directly with the upper cornua of the thyroid cartilage, and no play consequently is possible; in man on the other hand, great mobility is secured in these parts by means of an intervening flexible ligament, between the greater cornu of the hyoid bone, and the superior cornu of the thyroid cartilage, by which, change in their relative positions can be made at will.

Through these peculiarities of the jaw and hyoid bone the human larynx can be controlled and supplemented, and the wonderful faculty of speech is made possible.

ARTICLE II.

Filling Cavities of Decay in Proximal Surfaces.

BY MARSHALL H. WEBB, D. D. S.

In the mouth of civilized man we find an acid breaking down the enamel prisms and exposing the dentine, with its tubuli, when the progress of disintegration seems to be accelerated by the presence of *Leptothrix buccalis*, which are thought to have some influence in the causation of caries.

As this attack is usually made upon the proximal surfaces, we find that very frequently the insiduous advance has been such that the patient was unaware of the abnormal condition, or, being conscious of it, does not seek the services of a dentist until a fracture occurs or pain ensues.

It is then necessary to remove the cause of odontalgia—to get rid of an impingement upon the domain of vitality—

to take out the decayed portion, and, when the parts have been restored to a physiological condition, then cap that exquisitely sensitive and highly organized, complicated arrangement of nerve, artery, vein and connective tissue—the pulp—and finally fill the cavity produced by caries.

Where there is considerable irritation of pulp tissue, and where inflammation or congestion follows, it dies, or if the case then presents for treatment, its devitalization should be completed, and when in proper condition, the space occupied by the pulp before its extirpation and the cavity of decay should be filled. When one possesses the ability to treat *successfully*, and perform the operation of placing a material in a cavity so as to best supply the place of the lost tooth substance *artistically*, in cases where such complication exists, then one can readily succeed in those more simple. When cavities occur where the surfaces of the teeth approximate, presenting quite an extent of ruin, compound fillings are made necessary, and for the durability of teeth so affected, desirable.

In the April number of the *Dental Cosmos*, 1871, Dr. Louis Jack, of Philadelphia, described the manner of using the matrices designed by himself to simplify the filling of such cavities in bicuspids and molars. These matrices have been adopted by many, but as they are to be used after teeth are separated by pressure, and are so shaped that the contour of the tooth would be restored when the filling was completed, and now that a number of practitioners are accepting wholly, or in part, the views of Dr. Robert Arthur, of Baltimore, and are permanently separating the teeth, these appliances do not come into requisition so frequently.

Those who have been practicing the restoration of such contour and who have not, or only partially, adopted the views set forth in the recent work on the "*Treatment and Prevention of Decay of Teeth*," will continue the use of such excellent ideas. Cases present, not perhaps in the practice of every individual, but very often, where separa-

tion by pressure cannot conveniently be affected, or where it is best not to do so, sufficiently to admit of the application of a matrix of this character, then some modification and different manipulating may be required. Sometimes, too, no contour filling is indicated, because of the formation of a small cavity with firm lateral walls, though requiring a compound filling. In such cases a very simple, yet a very convenient and excellent aid is a portion of a fine separating file, such as Froid *oo.*

These can be placed in position when teeth are quite closely in contact; indeed, often as much as the thickness of such an appliance should be trimmed from the frail edges of the carious portion of a tooth, and sufficient space is thereby gained. To retain this matrix, the fine file-cut surface may be placed next the cavity, and will assist to secure such matrix when introducing the wedge between its smooth surface and the adjoining tooth, and while impacting the material for filling whether in the form of cylinders, blocks, pellets, etc., or gold or tin foil. When the filling is inserted the surface will not be so smooth as if the matrix invented by Dr. Jack were used; however, some finishing is always necessary, no matter what may be the matrix employed, or plan adopted. Where the proximal surfaces of either bicuspids or molars have been so attacked by caries as to cause the almost complete breaking up of such surfaces, and the walls are attenuated, it is best to cut away the overhanging edges of enamel, and gain free access from the masticating surface.

After applying the rubber dam, trimming away that portion of the margin which is likely to fracture, removing the decayed part, cutting out the fissures and making the cavity somewhat larger within than the outer edges, so as to retain the filling, apply a matrix, and the cavity is thus made a simple one.

When two teeth are thus attacked by caries where they come into apposition, the cavity in the one should be well prepared, filled, and the filling finished, and then the other.

Restore the proper contour of both, so that when the teeth approximate, the most prominent portion of the fillings will come in contact, and that the entire margin, against which the gold is packed, may be free, thus making the parts self-cleansing from the action of the muscles of the cheek and tongue. No dentine is then exposed, and if the operation be thoroughly completed, caries will not often recur, even if due cleanliness be not observed, which observance is absolutely necessary, for a considerable time at least, when permanent separations, requiring removal of enamel and often exposure of dentine, are practiced successfully. Maintain the same care in keeping the proximal surfaces of teeth cleansed and polished from their eruption without permanent separation, as must be done after the same is accomplished, and the enamel, as naturally presented, will most assuredly not yield to destructive agents, but become more dense as years pass by, and caries will thus be prevented. When cavities present in the proximal surfaces of bicuspids or molars where a considerable portion has been destroyed, it is quite frequently necessary to cut away some of the attenuated buccal as well as the palatal wall of enamel. In such case it is best to restore the contour, and allow the tooth, when filled, to come into apposition with the next in the arch at the curvature of the base of the buccal cusp thus built out. A separation is thus made toward the necks of the teeth as in nature, and as caries frequently extend along the dentine underneath the plate of enamel, so as to involve the whole of the proximal surface to the cementum, and the latter possessing the vitality to resist decay, it is quite certain that those parts will not again suffer from an attack of destructive agents, if the operation of preparing and filling the cavity and restoring the contour be thoroughly completed. The food, which may be pressed toward the gum during mastication, on entering the v-shaped space thus made, is, or can be, readily dislodged, but when forced between the parts of the teeth in apposition when the double v-separation is made, it is often retained at the necks of the

teeth, and if not removed, caries may ensue, such removal, at times, being difficult for the patient to accomplish. When these v or double v-separations are made, it is said to be done that the surfaces may be self-cleansing. So far as particles of food, large enough to be detected by the tongue, are concerned, this is true; so also, will the same prove true where no separation is made—the presence of such particles will be manifested through the pressure exerted, when wedged between the teeth, even if ever so slight, and no comfort will be afforded until such cause be removed. It is the atoms—the sediment—or food, collecting upon surfaces where the almost constant friction of the tongue and cheek is not had, which are acted upon, so as to assist in the causation of caries.

The tongue can remove none such from those separated surfaces; so that, if cleanliness be maintained, this being essential to prevent a recurrence of decay, it must be by artificial means, which will be more effective if permanent separations be not resorted to. When these separations are made by, or the case is in the care of an unskillful, or careless operator, or where the patient is one who will not preserve the cleanliness necessary, one can readily foresee failure. These failures will thus occur from time to time, and frequently until they will outnumber those from first-class operations in ordinary cavities without permanent separation, or from good, solid, artistic contour fillings.

When caries attack the proximal surfaces of incisor or cuspid teeth, and cause a fracture of the labial and palatal walls, the filling of such cavities is made difficult. The difficulty can frequently be overcome by taking a fine file and placing it between the teeth, with the file-cut surface resting on the adjoining tooth, the other side pressed against the palatal wall of the one to be filled, and held there firmly with the fingers of the left hand placed on the extension of the file. The filling is then introduced around the gold screw, or screws, or into the retaining points or grooves, and against the matrix, until the whole, or a part is com-

pleted. Where a portion of both the labial and palatal plates of enamel are gone the same matrix may be used by the bridging over, as it were, the space between the file and palatal margin of the cavity. When the remainder is filled and the matrix removed, the unconsolidated portion of gold on the palatal surface can be picked off, or the whole made compact, and the part fully built out.

When decay is so advanced as to necessitate the trimming away and filing from another than the proximal surface, the correct practice is to sacrifice the palatal edge of enamel. The same style of matrix serves a good purpose here also, so that when the enamel is broken down to near the cutting edge of the tooth, and is removed to secure firm edges and to enable one to apply the force in packing the gold in line with the tooth, thus lessening the danger of fracturing the labial wall, such matrix can sometimes be applied much on the same principle as for the bicuspids and molars. There are cases where the palatal wall of an incisor or cuspid tooth has not been affected by caries sufficiently to cause any injury to the enamel, while that of the labial surface is very brittle and often fractured, the opaque decay being clearly visible.

Very many practitioners object to exposure of gold, and rightly so too, where the exposure can possibly be avoided, but what shall be done when such a case as this presents? Resort to extraction? No, never, so long as a root remains with its cementum in a normal condition. Place crowns on such roots by first-class operations known as "pivoting," or otherwise. If quite a number of roots remain, or if some are missing from the anterior alveolar process, then extraction and the adaptation of teeth on a plate may be advisable. The best one can do when a case presents where the labial wall of enamel is fractured, or a portion of an incisor or cuspid tooth is lost, is to make the edges regular, restore the proper contour with a solid gold filling, and finish perfectly, when, with all indentations obliterated, such a filling will present an appearance as if burnished, though under some

circumstances, this burnishing should be dispensed with. Such an operation *well performed* is decidedly preferable to that where quite a space remains in consequence of the cutting away of tooth substance, often because of inability to perform a really good, artistic operation, but professedly to avoid the exposure of gold, while at the same time a lateral view reveals quite as much as otherwise, and the unnecessary space remains to mar the appearance not only of the other teeth, but of the face.

SELECTED ARTICLES.

ARTICLE III.

Alleged Death from Ether.

To the Editor of the British Medical Journal:—

SIR: Your issue of October 11th contains the following:— "We have this week to make the sad announcement of a death from the inhalation of ether. It occurred at the South Hants Infirmary. We shall be glad of the comments of Dr. Morgan and our Boston contemporaries."

The avowed interest attaching to death from ether, compared with that attending the rather common occurrence of death from chloroform, attests its rarity; and those who have been long familiar with the safety and efficiency of the former may think it perhaps a little late to subject it in England to an experimental test which the comparative fatality of chloroform seems at length to have secured for

it. I venture to comply with the invitation with which you have honored your Boston contemporaries, believing that until some anæsthetic shall be discovered equally safe, with less odor and less bulk, or perhaps some better form of anæsthesia than that by inhalation, ether must be considered on the whole our best anæsthetic. We need not here distinguish too nicely between anæsthesia, narcotism, and inebriation, when effected through the lungs. It is more important that special attention should be directed to several points connected with this subject which seem to be inadequately emphasized in contemporary European literature, especially asphyxia, pulse, and the real difference between what the Journals somewhat promiscuously denominate "death from ether" and "death from chloroform."

The Massachusetts General Hospital numbers more than 15,000 cases of ether inhalation, 6,000 of which have been recorded within the last five years. The quantity of ether consumed during these five years has been about 2,800 pounds,—half a pound, more or less, to a patient; in one case four and a half pounds in twelve hours. It fell to my lot, in 1864, and for a year or two after the discovery of ether anæsthesia, as junior surgeon, to administer most of the ether in that institution; and having been personally cognizant of a large proportion of the cases of its administration there, down to the present time, besides those in my own practice, I have never been satisfied of the occurrence of a single death which could be attributed to any property of ether, apart from the gradual and progressive inebriating influence it possesses in common with other anæsthetic agents.

A detailed report of a case involving so urgent symptoms and so prompt action as the one alluded to, is obviously liable to inaccuracy, and the account should therefore be accepted with reservation, and rather as a good illustration of an emergency quite likely to recur in the experience of those who may believe, with a late English medical journal, that the less the air, during ether inhalation, the better the an-

æsthesia, or, with the French chemist, that nitrous oxide only asphyxiates. Nobody doubts that asphyxia produces insensibility. This is easily shown with a bag containing a few gallons of atmospheric air. But this insensibility, necessarily brief, is unattended by exhilaration. It is distressing, accompanied by lividity, by rigidity if pushed far enough and is doubtless responsible for much of the dread which certain patients have of pulmonary inebriation.

The case in question is reported as follows:—

"David Newman, aged 14, a strumous lad, who had suffered from repeated attacks of corneitis, was admitted an in-patient of the above institution on September 25th, 1873, under the care of Dr. Lake. On Wednesday, October 1st, he was brought into the operating rooms in order that iridectomy might be performed. When on the table, he exhibited considerable alarm, and required some persuasion before he was induced to lie down. Dr. Griffin having taken charge of the pulse, half an ounce of ether was poured on a sponge contained in a cone of spongio-piline, and the latter was closely applied to the mouth and nose. After a few minutes' inhalation, the ether being nearly exhausted, three drachms more were poured on the sponge. Shortly after commencing to inhale this second quantity, he began to struggle violently, getting at length into a state bordering on opisthotonos, his face becoming intensely scarlet. Dr. Griffin then announced that his pulse, which up to this had been perfectly natural, had become very feeble. The ether was at once discontinued, when, the pulse having improved, Dr. Lake operated, no more ether being administered. At the close of the operation, which occupied only a few seconds in its performance, and before the eye could be bandaged, the pulse became imperceptible, the breathing was suspended, and the countenance livid. The tongue was drawn well out of the mouth, and held there; the calves of the legs were vigorously flagellated, and the chest freely slapped with a wet towel. The effect of these measures was to cause the patient to respire freely, to cry out lustily, and

to kick about on the table; but this improvement did not last long,—probably about a minute. The pulse at the wrist did not return, and the breathing again stopped."

Artificial respiration, electricity, etc., were resorted to, but without effect, and the autopsy revealed nothing of importance

In order to be clearly understood, let me here concisely restate this account, as I interpret the phenomena.

A feeble boy was etherized. During this process, though only partially narcotized, he was very completely asphyxiated, and, when nearly dead, was operated on without efforts at resuscitation. When at last his absolute prostration awakened serious alarm, he was vigorously flogged with the view of restoring his exhausted strength; and under this active stimulus was excited to a final muscular effort which expended and extinguished his flickering vitality. I believe that such a death might have occurred without the ether.

Let us consider the circumstances in detail, and see whether or not they substantiate this hypothesis; and first, the apparatus employed for inhalation. This was calculated to produce asphyxia.

If the spongio-piline was covered, as usual, with rubber, no air could reach the patient, except in the interstice between the cone and the patient's face. But, according to the account, the cone was closely applied. If so, absolute asphyxia would ensue. It may seem superfluous to say that during the etherizing process a patient must live, as usual, upon oxygen. Let us even needlessly assert that without it a man must die. Ether will not save his life, if he is deprived of oxygen. It would not have saved Desdemona.

Asphyxia did ensue; but its symptoms passed unheeded. The patient struggled violently. Now a half-conscious struggle often results from mere muscular excitement, and is of little moment. But a rigid struggle, with opisthotonos, is very different. Such spasm is connected with asphyxia, and may involve the muscles of the larynx. In this connection let me remark that there is a wide distinction be-

tween the common and desirable snore of a relaxed and vibrating soft palate and a croupy stertor of the contracted laryngeal aperture. The latter is a part of that general rigidity of which opisthotonos is a manifestation, and by excluding air it indefinitely prolongs the asphyxia which occasions it. Air is its only remedy.

These appearances are familiar, in the practice of the Massachusetts General Hospital, even to the house pupils and ward-tenders, to whom etherization is habitually entrusted. Lividity of the forehead indicates a probable similar color of the blood within the head, and announces that spasm may not be far off. Conversely, muscular spasm and laryngeal stertor direct attention to the color of the face. All these symptoms raise the question of admitting air promptly, and until the natural color returns. Indeed, it sometimes happens that because the muscles are rigid a patient seems imperfectly etherized, when the experimental admission of air relaxing the muscles proves the contrary. Even a half-conscious resistance, terminating in insensibility often makes the patient a little livid; so that a struggle then suggests examination of his condition, and sometimes an interval and re-commencement.

If all this be true of inhalation with a sponge, through the meshes of which air has free access to the lungs, and which for hospital use, if not the most economical, is beyond comparison the simplest and safest ether inhaler, what were the chances of a slender boy, struggling desperately for breath, rigidly convulsed with opisthotonos, his face congested, his mouth and nose still sealed by an impervious cone forcibly and closely applied until the pulse gave way?

I unhesitatingly submit asphyxia as the primary cause of death, upon this report.

Notwithstanding this condition of the patient, he was operated on. With so complete asphyxia, it would in Boston be considered of the first importance, before operating, to re-establish respiration, pulse, and color; after which more ether might be administered, to complete the anæs-

thesia. But in this case no such efforts were made, and no such interval was allowed. After a few seconds which were occupied by the operation of iridectomy, the patient still livid from his struggle with the closely applied cone, "the pulse became imperceptible, the breathing was suspended," and in "about a minute" he was dead.*

To this overwhelming effect of asphyxia upon a slender subject was doubtless added a certain amount of ether inebriation; but there is abundant evidence that this was but partial and incomplete. The quantity of ether administered was inconsiderable; and it is distinctly stated that the patient, when his legs were vigorously flagellated, and the chest freely slapped with a wet towel, "cried out lustily, and kicked about on the table," during the one minute he lived after the operation. Narcotism had not even reached insensibility to pain. No such imperfect ether anæsthesia can be held as principal in such a death.

It would be equally unphilosophical, in view of these facts, and in an endeavor to shift responsibility, to accuse the improbable shock of so slight a surgical operation, and still more any mysterious and as yet undiscoverod property of ether, outside of that familiar, gradual and comparatively inocuous influence which it posesses in common with other intoxicating agents. Further reference will be made to this.

A word about restoratives. The most effectual method of resuscitating a patient asphyxiated or over-dosed with ether is at once and quietly to get good air into his lungs. The volatile quality of both chloroform and ether makes their elimination from the pulmonary surfaces so easy, that even when breathing seems to have ceased, a little thoracic movement, artificially assisted, generally enables the patient himself to re-establish respiration, and brings up the pulse.

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* The fact that "the pulse improved" during a brief interval. does not necesarily modify the general aspect of this case —See *Principles and Practice of Medical Jurisprudence*, by ALFRED SWAINE TAYLOR, M D., etc., etc. Phila. 1873, Vol. ii. p 35.

A feeble boy, who had exhausted his strength in a violent struggle for breath and life, would have no great stock in store to respond to a vigorous flagellation. In this respect he might differ from one who had gone tranquilly to sleep with opium.

In arraigning ether, let us not confound things. All powerful therapeutic agents and expedients may, under certain circumstances, contribute to depress the system,—ether and chloroform among the rest; chloroform, as stronger than ether, possessing, of the two, the greater depressing influence. But this effect of a mere narcotism common to both, and which may contribute to the death of a feeble or dying patient, is not the real subject of discussion in the medical journals. The question is, has either of these agents, besides this gradual narcotic power, any additional, different, and peculiar quality, which renders it dangerous? To this I unhesitatingly reply, that chloroform has, and ether has not.

When we say "death from chloroform," we mean death by a shock or poison peculiar to chloroform, even when inhaled by a healthy person, under the most favorable circumstances, with abundance of air, and with every precaution; sometimes occurring at the beginning of anæsthesia undertaken for a trivial operation, almost as if by prussic acid; the sudden failure of a normal pulse indicating that the patient is beyond recovery.

With ether, I believe this to be simply impossible. It always acts slowly, never depressing the vital powers suddenly, or beyond recovery, without fair warning by the pulse in time to avert danger by the simple expedient of filling the lungs with unadulterated air.

In a somewhat extended paper upon anæsthetic agents, written in 1848 at the request of the American Medical Association, and published in the Transactions of that body, about one year and a half after Morton performed his first painless extraction of a tooth, and only a few months after Professor Simpson,s first experiment with chloroform, the

absolute necessity of air, the essential indication of the pulse, the difference between the snore of narcotism and the livid stertor of asphyxia, are all specified and insisted on. I may perhaps be pardoned for quoting in conclusion the following passage, which touches the main point of modern ether discussion.

"Ether does not prevent, nor is it to be considered responsible for, the ordinary collapse, resulting, in certain states of the system, after certain injuries and certain operations. The strong argument in behalf of ether is, that so few instances have occurred in which it could be even suspected of agency in fatal results.

"With chloroform the evidence is a little different. Two somewhat remarkable cases of death, occurring during the brief administration of this agent for surgical purposes, at once present themselves,—the Cincinnati case, and that of Mr. Meggison, at Winlaton. In these cases death occurred in about five minutes from the beginning of the inhalation. * * * * These instances suggest a specific cause of danger. This is the sudden impression upon the system of a powerful inebriating agent. Abundant alcoholic stimulus has often produced immediate death; and analogy would suggest that inebriating vapor in the lungs may be the equivalent of similar fluid in the stomach, and that in one or both of the cases alluded to, chloroform may have produced a sudden and overwhelming shock upon the system."*

Your obedient servant,

HENRY J. BIGELOW.

NOTE.

The inodorous and transitory character of anæsthesia by nitrous oxide, notwithstanding its attendant asphyxia, may perhaps recommend it for the brief extraction of a tooth;

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*Anæsthetic Agents their Mode of Exhibition and Physiological Effects by Henry J. Bigelow, M. D., one of the Surgeons of the Massachusetts General Hospital.—Transactions of the American Medical Association. Vol. I. 1848.

and we should not ignore the fact that chloroform insensibility is perhaps as safe as many other experiences which people do not hesitate to encounter,—crossing the Atlantic, for example;—and yet one accustomed to the use of ether in surgical operations protracted during an hour or more, with an occasional examination or injury about the pulse, and a suggestion to admit air, if the medical student in attendance happens to forget it, is not a little impressed by the solicitous and apprehensive circumspection attending English anæsthesia.

Under these circumstances, a few practical suggestions, in a familiar form, however superfluous or even trite to a part of the surgical world, may perhaps not inappropriately serve as a record of the current views and practice of etherization in the Hospital with which I am connected,—which has, perhaps, a larger experience than any other, of this form of anæsthesia.

1. Accept the odor and the bulk of ether as a cheap compromise for the safety of the patient and the confidence it gives the operator.

2. Believe that its anæsthetic effects, whether pleasant or objectionable, do not differ materially from those of chloroform.

3. Recognize the fact, while chloroform may kill without warning, ether never does.

4. Aim at anæsthesia by inebriation, not by asphyxia. With ether vapor, insure air to the patient. Though he struggle at the beginning, if he is not rigid or too livid, it is safe to compel inhalation; but if you can devote more time to the process, the resistance will be often less.

(Before etherizing, remove false teeth, and loosen a tight dress.)

5. Use, and let hospital assistants use, a good-sized bell-shaped sponge; and then it may be a question of less rather than more air. The various forms of apparatus which restrict or graduate the quantity of air require more attention and more assistance. Of these a close bag is the worst. If

the sponge is damp, it retains ether better, while the vapor is perhaps a little softer than when absolutely pure. The ready ignition of the latter suggests the precaution of moistening with water the skin and saturated linen, before employing near the face even galvano-cautery.

(The gravitation of the vapor makes it practically safe by night, if lamps are held above it.)

6. Keep the pulse in hand; at any rate, examine it often. When the pulse is right, the patient is so. With chloroform, the pulse may be right and the patient wrong. If slow or feeble,* or if the patient snores more than he need, save his strength by giving air,—at any rate, until the pulse comes up; but renew the ether before he is sensible of pain. If the pulse shows that he is suddenly faint, lay him down and give him air. Faintness not unfrequently results from nausea, and is relieved by vomiting. In a case of doubtful pulse, a contractile pupil reassures the operator; a dilated pupil renders him more cautious.

7. If the patient is livid or rigid, give him air.

8. If his glottis contracts, give him air.

10. Should he vomit, of which there is usually timely

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* "Here is the precaution against danger: . . . . this sign is *the diminution of the force and frequency of the pulse.*

"In an early case of the administration of ether by Dr. Morton, and which has been reported, the danger from over narcotism was quite as imminent as in any case I have since seen alluded to As a bystander, on that occasion, I casually felt the pulse, and found it barely distinguishable; and though it subsequently still decreased, the means at once adopted for the restoration of the patient proved ultimately successful. This occurrence pointed to the pulse as an index of the stage of narcotism, a few subsequent experiments confirmed the belief; and I have not since hesitated to push etherization to complete insensibility, and to continue it, if necessary, during a length of time, provided the pulse remained full and strong: If it be retarded by ether, it is curious to observe with what certainty it recovers force and frequency, after a few inspirations of pure air. It will be inferred from these remarks that the pulse is to be carefully examined during the whole anæsthetic process and that inhalation is to be temporarily discontinued at its indication."—*Anæsthetic Agents, etc.*, 1848.

notice, give the matter free exit by turning the patient, if recumbent, well to one side. Although there is less nausea with an empty stomach, it is not well to starve a patient about to encounter a protracted operation.

11. From time to time evacuate the tracheal mucus from the fauces, during an expiration, with a sponge held in dressing forceps.

12. In operations about the nose and mouth, give for convenience, a powerful dose before beginning. Impregnate the whole circulation to the degree it usually attains in the middle of a long operation. The patient is then easily kept quiet. Otherwise a volume of fresh blood may find its way to the brain, and suddenly revive him. Let the repeated dose be also heavy.

13. In these operations, expect blood in the trachea, and evacuate it like the mucus,—but, by reason of its quantity, more promptly.

14. Indeed, if such an operation promises much blood, have a tracheotomy tube ready, with hooks to hold the incision open while they compress the veins, so that the tube can be entered by a cut or two in a few seconds.

15. Or insert the tube before the operation, and put a sponge in the pharynx. The patient may then be etherized through the tube. I have had occasion to resort to these expedients.

16. In artificial respiration, act with the patient, and not against him. He will not cease to breathe at once, and wholly. Enjoin silence; watch the first attempt at inspiration, and at the expiration compress the thorax, aiding its elastic reaction, if absolutely necessary, by Silvester's, or other quiet method. See that the tongue is well forward.

17. Do not cool the patient by exposure and wet surroundings.

18. Being first assured that he can swallow a teaspoonful of water, feed him, if you like, with stimulus, during the expiration, but not the inspiration.

19. Give to all painful surgery, without exception, the

benefit of anæsthesia; but a patient unequivocally exhausted by long disease,—of the bladder, or of a joint, for example, —or an habitual inebriate, may require care; without which protracted narcotism may gradually depress his pulse beyond the rallying point. On the other hand, a healthy laborer, who reaches the hospital some hours after a railroad accident, cold, and literally pulseless at the wrist, from hemorrhage and exposure, is, as a rule, stimulated by ether, during and after at least one amputation.

20. Notwithstanding every expedient, there is occasionally an untoward subject who is habitually tetanic and livid, whenever etherized; or, more rarely, one whose respiration is notably intermittent before he becomes insensible. The latter requires attention. In children, it may be added, anæsthesia is cumulative.

Such are some of the minor considerations and prompt precautions which collectively determine the question of life or death in the exceptional emergencies of anæsthesia by ether. Many of them apply with equal force to chloroform; but against the shock of chloroform and its sequences, whether "chloroformic syncope," "cerebral anæmia," or "cerebral congestion," precaution avails nothing.

ARTICLE IV.

Old Way and the New in Dental Practice.

BY S. WELCHENS, D. D. S., LANCASTER.

In these days of scientific wonder and rapid professional development, it may be well to take a retrospective view of our specialty, and thus endeavor to improve the future through and by the experience of the past. It will doubtless be conceded by all practicing dentists, who are capable of ordinary observation, that there has been, in the last three or four years, so much of a change in the operative branch of the dental profession as to almost amount to a complete

revolution. The old method of health and usefulness, has given way to a system far superior and almost diametrically opposite, through a succession of new discoveries, appliances, improved material and scientific treatment, to such an extent, as to make the expert in the old way, who has not kept up with the times, a perfect novice in the new; and those who are regarded as first-class operators in the new way, who have become so alone by virtue of these improvements or appliances, to be unable to operate with any degree of success or merit in the old.

Now, whilst we regard it as a duty as well as a pleasure to keep pace with and encourage meritorious advancement, and every new and valuable discovery, we nevertheless deprecate, to some extent at least, the formation of "*corners*," by which old, and what in the days of Harris were regarded as scientific operations, are hid out of sight.

For instance, here is an old practitioner, enjoying both the confidence of his profession and the community in which he lives. He has kept up with the age of improvement and abreast with best operators for a quarter of a century; whilst round the "*corner*" is a young man with but four or five years' experience, regarding him as an "old fogie," and characterizes his best work as mere quackery, simply because he was educated in the old principles, and still adheres to some of the old practices in operating. We must confess that there is something about this that does not meet our ideas of what might be regarded as scientific professional advancement. It ignores experience and wipes away well established principles which are the result of years of meritorious practice.

It is unquestionably the duty of a practitioner to avail himself of every principle and appliance that will improve his operations and enhance his knowledge of the complications of his profession. But at the same time, a rational scientist will respect old practices that were good in their day, and in his researches will seek a sort of "*ex-post-facto*" training before arrogating to himself leadership, or absorb-

ing within himself all that is really meritorious in his profession. Instead, therefore, of an abrupt "*corner*" being formed that might hide from the view of our young and conceited members of the profession, those old principles which brought it up to a respectable standard in the scientific world in former years, there should be a blending of the elements of improvement; a sort of succession of links, as it were; or a "mathematical progression," if you please, fortifying the new with the old, thus connecting two systems in one grand comprehensive status, in which the operator may be made to feel at home in good practice, and which would afford him all the resources necessary to meet new and complicated cases without drawing on other men's brains, genius or experience when difficulties arise. His education should enable him to be "eclectic" at times, which simply means to let in the light of other days and the old authors, and not despise the labor and the genius that laid the foundation for the improvements we are now enjoying.

Improvements in Dental Depots.—Everything that will save time and labor is a real, substantial benefit and aid to the dentist. There was a time when dental depots were both scarce and poor. They, like the profession, rejoiced in the magnificence of their professional meagreness. Then, while the depots were poor, there was some danger of the dentists becoming rich. But since the extreme prosperity of the former, the best efforts of the latter to reach that devoutly wished for consummation is fruitless.

We do not complain of the commendable energy exercised by the depots in emulating each other in getting up new appliances, and surrounding each new discovery with so much interest and real benefit to the dentist as to render it absolutely necessary that he should avail himself of the improvement, or fall ten years behind the times. This, 'tis true, is a diversion which turns the tide of prosperity from the profession toward the manufacturers. But, then, this enterprise has given us so much that is really good that we can afford to work "from hand to mouth," to keep it up, and the fact

that it averts the danger of our ever becoming rich should be sufficient to reconcile any dentist to the change it has produced.

For example, twenty-five years ago, when I purchased my "*kit*," it took me three or four days to gather up the "*traps*," and spend my hundred dollars. That sum was to me then a small fortune, and it seemed to be about the same thing to the "*depot*," for it did not only secure me the most unremitting attention, but it fairly exhausted the depot. Now you can spend that sum in your office some fine morning before breakfast, (provided the itinerant depot vender stops over night in your town,) and get for your money the half of a Harris' chair, or two thirds of a dental cabinet, or one Morrison engine and the half of a fountain spittoon, or an electric plugger and patent stool; all as specimens of the latest improvement, and the most trifling purchases. *Then* the selection of a set of teeth to suit your case would require a whole day, provided you had a good assortment to select from. Teeth were measured out to you by the quart, and if the "assortment" was good, of course the *mixture* would be grand; and the whole day thus consumed was put in with the most exquisite professional torture. When, therefore, artificial teeth came to us arranged in sets, and spread out on strips of wax, the change was almost overwhelming, and the improvement was of incalculable value.

Thus the depots have been creeping up, making valuable improvements; adding one new appliance to another—one useful discovery to another, until we are dazed with the beauty and grandeur of the display, and feel that we are really ten years behind the age of improvement when we see their stock of goods, and feel unable to try every new thing, or appropriate the entire selection. That such enterprises should reap the reward of colossal fortunes is not to be wondered at, and ought not to be begrudged.

Improvements in Mechanical Dentistry.— There was a time when artificial dentures possessed real intrinsic value. They were mounted upon gold and and silver plate, and re-

garded by the wearer as perfectly comfortable and serviceable. In those primitive times, plain plate teeth were used, and mounted on plates that were cut out so as to be simply wide enough to cover the ridge of the maxillary jaw, Where an entire denture was needed, spiral springs were used to keep the plates firm to the gum.

This work, though good in its day, was somewhat troublesome, both to the dentist and the patient. Wax being used for impressions, the fit, of course, was approximate, and the benefit to the patient about the same way, until custom overcame the difficulty. At a subsequent period, however, improvements were introduced, and with the advent of the air chamber and gum teeth, we imagined the advancement a little too rapid, and readily consented to stop a while to enable all to get up with the times. Rims on the plates, both swaged and turned down, were added to the general tenure of this work, and block teeth, continuous gum work, and the various methods of soldering to avoid warping, were among the more immediate improvements.

The laboratory became the centre of science in the profession, and our best men emulated each other in raising this branch of the profession to the highest standard of artistic skill. The work produced by our best operators was really beautiful and perfectly serviceable. It was science in art, and constituted an era in the profession that should not only not be despised, but should never have been suffered to be superseded. The downfall of this art started with the advent of casting plates from the baser metal, and the use of rubber and other vegetable substances. Beautiful and even serviceable dentures were, and still are constructed from those cheap materials; but the change was so great, and the manner of performing the work so opposite, that a "*corner*" was formed, rendering those who are taught and skilled in the latter mode of mounting teeth alone, unable to work in the former with any degree of success.

The very simplicity of this latter kind of work, and the ease with which it was constructed, drove science out of the

laboratory, and reduced the mechanical branch of the profession to the level of a trade or handicraft. So far, therefore, as the improvements in this department are concerned, the progress has been backwards from a scientific standpoint, and it behooves us all to see to it, that the operative branch through this progression of appliances and new discoveries does not meet with the same disaster, thus making the last great blunder worse than the first. We think we see symptoms of this already in the increase of the use of the baser metal in foils and amalganis, and the various cements and stuffings which are too readily resorted to where a more complicated and more permanent operation should be performed. Is there not some cause here to fear that that nice artistic manipulation of pure gold will be forced to surrender to the overpowering advance of those cheaper materials in filling teeth?

Improvements in Operative Dentistry.—The new mode of operating with the appliances now in vogue, leads the mind into a similar channel of thought, with well grounded fears for the future in that department of our specialty.

With the rubber dam, burring engines and improved patent pluggers of recent date, it does not require much more talent or skill to become a good, even a first-rate operator in filling teeth, than it did several years ago to put up first-class dentures on the rubber base. The most difficult part of the operation to manage is to adjust the rubber dam. When that is properly done, an ordinary individual, with but a low degree of mechanical ingenuity and but partially expert in working gold, can perform very difficult operations and bring them up to what is termed a first-class standard, when the same parties could with difficulty reach mediocrity in the old method of practice.

Here then is a fruitful source of solicitude, lest what we now look upon as the highest attainments of skill be lowered both in value and excellence, by comparatively ignorant and irresponsible men.

It is not our purpose to disparage those improvements, or to underrate those operations which are so well performed

by scientific men. But is it not apparent that since the profession has been benefitted by those appliances, what may be termed good operators are far more numerous, whilst earnest, thinking, reading and scientific men are rather on the decline?

But it may be asked, what have we to fear from all this? Why just this. The profession will be literally run down with good superficial operators, who care more for their own pockets than the status of the profession, and it will be dragged down to the level of a common mechanical pursuit. Or, in other words, the mechanical element will be highly cultivated, and the competition arising therefrom, as in the rubber work, will reduce the valuation of such work, the intellectual element will become stagnant, the qualifications of the dentist will be meagre and low and unable to reach the true genius of the profession as a branch of the healing art.

As a profession, we want first-class operators. We also need all the appliances we can get to facilitate our operations; but at the same time we must give heed to and appreciate old and well-tried principles, and thus guard and develop that balancing intellectual power which gives the mind scope and discrimination to comprehend the complications of disease, so as to be able fully to meet every case with a due sense of that responsibility which should characterize a member of an honorable profession.

This, of course, will admit of no cutting away of old principles, or even the old method of practice, so as to form a "corner." But it will call into requisition every element of improvement, and lead men to value more highly those primitive principles which served as stepping-stones to higher and more advanced stages of excellence.

There is a majesty in the moral force of a scientific profession that should be the chief safeguard to its dignity and usefulness, and that should dictate the rule of action in the case of any man who would excel as a practitioner. This does not consist alone in the superiority of this or that operator's work—his own sense of his own excellence, nor of

the amount of "*blowing*" he may be capable of. It is the force and power of the quality of usefulness he may possess, in rendering himself useful to the public, with a reciprocal appreciation, and without any further effort to please than simply to *perform well a present duty*, rather than that any man should indulge in this preposterous self-laudation.

The dental profession, like the medical profession, is an untiring and ceaseless research after *truth*. In every instance where pathological conditions are present, and their locality and extent are determined by symptoms alone, every step and movement made in the diagnosis is a search for the truth. If, therefore, there is a deficiency here, and the individual who adopts our profession is superficial in those fundamental principles, no matter how meritorious his mechanical manipulations may be, *he is a quack*, and no amount of good work or self-praise will extricate him from that unenviable position.

This idea, then, is all that is left to connect the old way with the new. It is not our operations alone, for in both branches of the profession they are performed entirely different to what they were ten years ago. It is the practitioner's scientific calibre; his skill in the healing art; his knowledge of the principles and practice, old and new; his theoretical research, and his ability to grasp and comprehend every case, however complicated; his correctness of judgment, and his boldness to execute these render him the reliable, skillful operator, and master of his science.—*Transactions of Penn. State Dental Society.*

ARTICLE V.

Aluminium as a Base for Artificial Teeth.

BY DR. S. M. FURMAN, OF LEAVENWORTH, KANSAS.

Read before the Kansas State Dental Association at Ottawa, Oct. 14, 1873.

Believing that this metal is strangely overlooked in the dental laboratory, the writer would endeavor to point out some of its advantages as demonstrated by his own expe-

rience, and meet some of the objections urged against it. The writer has used it only by Dr. Hollingsworth's method, and although it can be neatly manipulated in connection with rubber, a more perfect plate can be secured by his process than by swaging.

In enumerating the objections brought against cast plates we have—1st. The question of shrinkage. 2d. The danger of crushing the block and uncertainty of finishing the plate for the patient at the appointed time.

It is a well known fact that all materials used for bases, except swaged plates, shrink upon cooling, and rubber is no exception to the rule, as all who have seen a "rocking plate" will testify. With this metal, as with celluloid also, the blocks of teeth when closely fitted together admit of a vertical shrinkage *only*, and consequently the back teeth are drawn so much towards the center of the plate that the above mentioned abomination, a "rocking plate," is produced. This difficulty is obviated in Aluminium, as the spacing of each block before casting admits of a slight shrinkage in *all* directions without drawing or changing the form of the plate. I have never seen other than a perfect fit with this metal, with all the finest lines of the mouth faithfully represented.

To meet the difficulty of the crushing of the blocks in cooling, a delicate paste is introduced between the blocks before casting, which while being stable enough to prevent the flow of the molten metal into the joints, is compressed into so small a space as to be scarcely noticeable on removing from the flask. The paste is also used around the upper margins of the artificial gum, to prevent accident at the rim from the inevitable shrinkage.

That a perfect plate will always be secured, the writer cannot assert, but he has met with complete success in nearly every effort; when failures have come they were anticipated before opening the flask, and were the result of some departure from the directions of the inventor.

The durability and cleanliness of aluminium no one can deny; while its extreme lightness, being but one-seventh

that of gold, and its freedom from discoloration, establish the value of this remarkable metal as a base.

That it will ever be used by itinerants as a cheap base at degrading prices, is impossible, as a skilled hand is necessary in carrying out the delicate manipulations in preparing such a denture for the mouth. Honorable men should give the public the benefit of this invention.

It takes less than one ounce of metal, ordinarily, to make a plate, while from ten to twelve hours is ample time for the whole process.—*Missouri Dental Journal.*

ARTICLE VI.

Vulcanite Litigation.

PORTLAND, January 17th, 1874.

On the fourteenth, fifteenth, and sixteenth insts., before the Hon. George F. Shepley, United States Circuit Judge, sitting in equity at Portland, Maine, the cause of the Goodyear Dental Vulcanite Company and Josiah Bacon against Daniel H. Smith was argued. This was the case selected by the Company and Mr. Bacon from those in which were set up the defences already made familiar to the readers of the *Dental Cosmos* in the supplement to the November number. Mr. Dickerson and Mr. Lee argued the complainants' case. Mr. Baldwin presented the points of defence, and in connection therewith read and filed a written argument submitted by Judge Black.

Judge Black was unable to attend in person, by reason of engagements which detained him at Washington. Dr. Smith was also represented by E. O. Shepard, Esq., of the firm of Messrs. Jewell, Gaston & Field, of Boston, his immediate counsel of record.

The argument occupied some seventeen hours, about equally divided between the complainants and the defendant.

The Judge patiently and indulgently heard the case presented at the greatest length desired by either party, and for that purpose extended the time very largely beyond the limits fixed by the rules of the court. We purpose to publish at least a synop-

sis of the argument on both sides, but not until the decision shall have been announced. Meanwhile, we congratulate the profession upon the fact that the hearing has been had, the questions presented and submitted, and the determination of those questions confided to a Judge whose deportment and character give an impress to the argument of the cause which assures us that, whatever may be his conclusions, they will be the fair convictions of a judicial mind after careful consideration, and with a clear comprehension of all the matters of fact and of law involved in the record.

When the decision will be announced we cannot conjecture, but it will, no doubt, be promptly rendered, and we can now only look for it with the solicitude which all the profession will share, and with the sanguine expectation based upon the same grounds which have always been our reliance, and which, after being argued faithfully, have been confided to a court which commands universal respect.

With the publication of the arguments we shall take occasion to make a somewhat extended statement of our own attitude in this litigation, such prominence having been given thereto by the complainants' counsel at the hearing as to make it a leading feature of their side of the case ; otherwise we should not feel it incumbent on us to say a word in that behalf.

SAMUEL S. WHITE.

EDITORIAL, ETC.

The Thirty-fourth annual commencement of the Baltimore College of Dental Surgery will be held at Concordia Opera House, on Thursday evening, February 26th, 1874. Prof. Henry Reginal Noel, M. D., will deliver the "Valedictory Address," and John W. Farmer, M. D., of Virginia, the "Class Address." The alumni and friends of the Baltimore College are respectfully invited to attend. The Dean of the Faculty will furnish cards of admission to all such as may call upon him on their arrival in the city.

Prof. P. H. Austen, M. D., D. D. S.—The many friends of Prof. Austen will be pleased to learn that he has so far recovered from his late severe indisposition, that he has for some time past been delivering lectures in the Baltimore College of Dental Surgery, and expects to continue doing so throughout the session.

Letter from Dr. W. H. Morgan.

NASHVILLE, January 2nd, 1874.

MR. EDITOR:—In the December No. of *Missouri Dental Journal*, I find this paragraph: "In an obituary notice of the late Dr. Amos Wescott, the author states that the organization of the Baltimore College of Dental Surgery was due to the efforts of Dr. Wescott. While we admit that Dr. Wescott was a very efficient member of the Faculty of this institution in its early days, we think that great injustice has been done to others in making a statement of this nature which is so wide of the truth;" and further on we have the following: "Dr. Amos Wescott did not become a member of the Faculty of this institution until 1846, and resigned in 1849, as the records of the College now in the

possession of the writer will show." This leaves us to infer that he was an efficient member for two years or two sessions at least: such is not the fact, as reference will show that the undersigned attended that college during the sessions of '47 and '48, and here states that Dr. Wescott was not present, and therefore did not deliver a lecture in the College during that term, closing March 1st, 1843. This statement can be verified by Dr. A. A. Blandy and Charles Ballard, of London, Dr. John McCalla, of Lancaster, Pa., and Dr. T. J. Jones, of Ga.

Very respectfully,

W. H. MORGAN.

[We can explain by stating that Dr. Wescott held the position of Demonstrator of Operative Dentistry for one session prior to 1846, and was then elected Professor of Theory and Practice of Dental Surgery, and although he was not present during the session of 1847–48, yet his resignation was not acted upon until the close of this latter session, hence his name remained upon the books as filling the Chair referred to.]—ED.

New Dental Journals.—Two dental journals having recently gone out of existence, the *Dental Times* and *Canada Journal*, their places have been filled by appearance of two new publications named respectively the "*Pennsylvania Journal of Dental Science*," edited and published by Samuel Welchens, D. D. S., Lancaster, Pa., and "*Johnstons' Miscellany*," published in New York by Johnston Brothers.

Dr. Welchens, the editor of the "*Pennsylvania Journal of Dental Science*," is a graduate of the Baltimore College of Dental Surgery, of the class of 1859, since which time he has been in successful practice in Lancaster, Pa., and has occupied a prominent position in the Pennsylvania State Dental Society. The first No. of the new publication contains a photograph and biographical sketch of the late Prof. Chapin A. Harris, A. M., M. D., D. D. S., written by Dr. Jno McCalla, an early graduate of the Baltimore College, and is in every respect a well prepared and interesting number. The "*Dental Miscellany*," from the New York Dental Depot firm of Johnston Brothers, contains among others, two short articles on the "Fractures of the Inferior Max-

illa," by N. W. Kingsley, D. D. S., and "Syphilitic Teeth," by T. B. Hitchcock, M. D., D. D. S., and selections from other journals; it presents a very creditable appearance, and promises to be a useful addition to dental magazine literature.

Convulsions During Dentition, etc.—J. M. Hall, M. D., in the *Medical and Surgical Reporter*, recommends Valerian in the treatment of this affection, and also gives some general directions to be followed during the continuance of the paroxysm:

"Of late it has been my lot to attend quite a number of little patients affected with convulsions. The patients presented symptoms which were pretty uniform, as follows:

The attack generally commenced in the eyes, which were fixed in one position at first, staring, but as the cases advanced they became agitated, and were turned up beneath the upper eyelids, leaving only the whites visible. The eyelids were sometimes open, sometimes shut; and not unfrequently the eyes were crossed, with pupils dilated or contracted. The muscles of the face next became affected, and the contractions produced at various times violent contortions, the mouth being distorted, sometimes the jaws firmly set, or, again, in violent motion. In a few cases there was foaming at the mouth. In the severer ones, when the spasm became general the whole body was convulsed violently; the head was thrown backward or to either side, the body becoming stiff and rigid, or variously contorted. The fingers and thumbs were drawn into the palms of the hands, the arms thrown backward, or jerked and drawn into all conceivable positions. The lower extremities were likewise sometimes affected, but not generally in so violent a manner. The duration of the "fit" was different in different cases, sometimes continuing for an hour or more, and in the milder cases only lasting for a few minutes.

The most common causes are irritation of bowels from indigestible food, teething, worms, excessive crying and pains, anger and joy. A dangerous form results from overloading the stomach with indigestible food. The most serious case I ever saw to recover was the result of feasting on a large quantity of grapes. The eruptive fevers very frequently produce them. The list of causes might be increased, as I believe the causation may arise from many other sources.

The prognosis in those cases, for the most part, may be favorable, as I believe all will recover except those complicated in some way with cerebral trouble.

The first thing I have done is to prepare a warm bath and put the child in as soon as possible. Where the attacks are very light, a foot bath, with a little mustard, is sufficient; but in the more severe cases, the bath must be a general one. As for medication, I have relied entirely on fluid extract of valerian, in doses varying from ʒ½ to a ʒ, mixed in water and administered as often as fifteen or twenty minutes between the spasms. persistently repeated, with an occasional mild injection of warm water and assafœtida, which gave results so satisfactory that when called to cases of this character I do not feel justified in adopting any other mode of treatment."

Webster's Unabridged Dictionary.—Ten thousand *words and meanings not in other Dictionaries.* Three thousand Engravings, 1840 pages quarto. Price $12 00.

In the original preparation of Webster's Dictionary, Dr. Tully, a physician of eminence and great learning, took a prominent part. In the last revision, 1864, the medical department was carefully revised, and as stated in the Preface, "In Physiology and Medical Science, Professor R. Cresson Stiles, M. D., of the Medical School of Yale College, has furnished many carefully considered definitions and emendations," whilst in Botany, Chemistry, and kindred Natural Sciences, a thorough revision, by the most competent scholars, took place."

What volume, next to purely professional books, (and this is hardly less, medically, than a professional one,) of greater and more constant usefulness to the medical student and practitioner than Webster's Unabridged Dictionary?

"Excels all others in defining scientific terms."—*President Hitchcock.*

☞ A National Standard. The authority in the Government Printing Office at Washington, and supplied by the Government to every pupil at West Point.

Webster's Dictionary is the Standard authority for printing in the Government Printing Office, and has been for the last four years.—A. M. Clapp, *Congressional Printer.*

MONTHLY SUMMARY.

Incombustible Paper and Fire-proof Ink.—An invention has been recently patented in this country, which, if it will only stand the test, should have a wide field of usefulness. A really incombustible paper, without a fire-proof ink, would be a very valuable article in many businesses, and for many purposes of everyday life, but if it can be supplemented by a fire-proof ink, its value will be enhanced tenfold. Such a discovery Mr. G. W. Halfpenny believes he has made, and has accordingly securd his rights by obtaining the Great Seal. We gather from his specifications that the paper prepared by his process is absolutely indestructible by fire of any degree of fierceness, but that under such circumstancees as fires in houses, factories, or other buildings, it is "ordinarily incombustible." The inventor prepares his paper in the usual manner, from a pulp consisting of vegetable fiber, asbestos, alum and borax, in about the following proportions: Vegetable fiber, one part; asbestos, two parts; borax, one-tenth part; and alum, two-tenths of a part. The vegetable fibers are minutely divided, and treated in the manner usual in the production of ordinary paper: the asbestos is also divided as much as possible, and the two are theu intimately mixed with the alum and borax in a sufficient quantity of water to make a pulp of the requisite consistency, which is then made

into paper by any of the well-known processes. The proportions given are not rigid, but may be varied to suit the quality and nature of the desired product, and also to suit the different qualities of the raw materials.

Thus, the inventor says he has made incombustible paper in which the proportions of the ingredients varied from 50 to 70 parts of asbestos, and from 30 to 50 parts of flax or other vegetable fiber, with only two and a half per cent. each of alum and borax. He proposes to use in some cases silicate of soda, in order to insure hardnesss and coherence in the substance of the paper after it has been acted upon by fire. In order, we presume, to obtain a paper of great strength and flexibility, the sheets may be made of linen or other woven fabric, and coated on both sides with the incombustible paper.

The fire-proof ink for use in writing or printiug on the incombustible paper is made of the following substances in or about the proportions given, in apothecaries' weight: Graphite, twenty-two drachms; copal or other rosinous gum, twelve grains; sulphate of iron, two drachms; tincture of nut galls, two drachms; and sulphate of indigo, eight drachms. These materials are mixed together and boiled in water, the graphite, of course, being reduced to an impalpable powder. This ink, which besides being fire-proof is said to be insoluble in water, under ordinary circumstances is black; but when colored inks are desired, the graphite is replaced by an earthy or mineral pigment of the desired color.

Another portion of this invention consists in the application of the incombustible paper pulp to the manufacture of covers for books, and of wrappers or envelopes for parcels and packages. The inventor also utilizes talc for this purpose, singly or in combination, with his incombustible mill-board or ordinary boards. Thus the "back" of the book may consist of a number of slips of talc over lapping one another, secured to and supported by a piece of incombustible paper.—*English Mechanic.*

The Use of Sewing Machines.—During the late session of the State Medical Society of Virginia, at Staunton, Dr. Parker read a very interesting paper on the subject of sewing machines and their effect on the health of women, in which the conclusions were announced:

First. That fatigue is not disease, and that there is no reason to conclude that the use of the muscles employed in machine-work for a reasonable time is injurious. Second. That the machine may be used for four or five hours daily in a family, by a lady in ordinary health, without injury. Third. That the damage to health in the factory is due to the hygienic conditions

under which the work is done, and the natural delicacy of some of the operatives, unfitting them for long-continued labor of any kind. Fourth. That the sewing-machine is a great boon to womenkind, increasing her compensation, protecting her sight, and in the family lessening her labors.—*Med. and Surg. Reporter.*

Counterfeit Diplomas.—The establishment on Pine street, Philadelphia, where medical degrees, regular and honorary, are conferred at so much a head, has been several times sharply overhauled, but has continued prosperous in spite of its overhauling. The greater the discredit into which the "American University of Philadelphia" has fallen at home, the greater the energy with which its business has been pushed at a distance, and the more lucrative its returns have been.

It must be allowed that there is a large element in human nature that likes to be humbugged ; otherwise such frail securities as El Paso railroad bonds and Emma mining stocks would never have had a successful run in foreign exchanges, where nothing authentic was known about them, and from the nature of the case it was impossible that anything could be known. Upon this same credulity and conceit, manifested in a different way, the shrewd Yankee operators in university titles have played successfully, and they have found the market lucrative enough to pay for great risks at home. There is a good prospect now that this particular kind of swindling will be brought to an end. Responsible charges have at last been filed, and the "American University" will be called to answer upon what warrant its proceedings are based. The charges come this time from Germany, where the sale of bogus titles has been vigorously carried on through resident agents. The chief agency was in charge of "Dr. P. F. A. Vander Vyver, LL.D.," Jersey, England, to whom all persons who wished to be promoted to any degree by this university, without being personally present, were to send their applications, and $120 in money—being the total cost of the diploma.

This eminent doctor of laws advertised extensively in German and other European papers, setting forth the facility of getting degrees in this way, without the usual inconvenience of previous study, or even of a Journey to America and back again. Here and there gentlemen of moderately good standing among scholars, have been tempted by Dr. Vander Vyver's prospectuses to bid for these paper titles, and have worn them with great complacency, till the swindle was fully explained to them. The authorities of Philadelphia, in company with the officers of the University of Pennsylvania, with which the bogus university has been confounded, are not at work, with the evidence of its

deception in their hands, to bring its officers to justice, or, failing in that, at least to put a stop to their business.—*Boston Daily Advertiser.*—*Boston Med. and Surg. Journal.*

Bones from Dissecting-Rooms.—An extraordinary quantity of human bones, says the *Lond. Med. Times*, has been found in the excavation for the foundation, upon which workmen have been for some time engaged, of the new wing of the London Hospital, the site of which will be the old Medical College. A shed which stands in a corner adjoining the works is filled to the roof with these bones. Besides these, no less than fifty-two coffins, filled with bones, have been removed to Ilford for re-interment. It is calculated that what remains will fill thirty more coffins. The contents of each coffin weigh two hundred-weights, making in all about eight tons of bones. Taking the average weight of a human skeleton to be fourteen pounds, it is found that this shed contains all that now remains of no less than 1,280 human beings. They are in an excellent state of preservation, though they have evidently been beneath the ground for a great number of years. It may be mentioned that at the time the great Windmill-street School of Anatomy ceased to exist, an immense quantity of bones was found in deep, dry wells, the accumulation from the dissecting-rooms of probably half a century.—*Druggists' Circular.*

Children Versus Crime.—Bertillon, in some interesting statistics relating to the population of France, laid before the Academie de Medecine not long since, stated that in a million married persons without children there is an average of 175 convicts yearly; while in the same number with chlldren, there are but 109. In a million childless married men, 470 commit suicide annually, while in an equal number with children, only 205 make way with themselves; among married women the proportion was 157 to 45 ; widowers with children, 526 ; without children, 1004 ; widows with children, 104 ; without, 238.—*Med. and Surg. Reporter*

The Legal Value of Teeth.—A curious law suit was recently tried in a New Hampshire court. A widower brought suit for damages to the amount of $5,000 against a dentist who etherized his late wife and extracted more teeth than she meant to part with. It seemed to have been a blunder on the part of the dentist, and the jury, apparently being in doubt how far a husband suffered such injury from the loss of a jaw power on the part of the wife as could be compensated in damages, brought in a nominal verdict for the plaintiff.—*Med. and Surg. Reporter.*

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ARTICLE I.

Professional Excellence.

An Address of Dr. W. W. H. Thackston, President of the Virginia State Dental Association—delivered at its last Annual Meeting.

Gentlemen of the Virginia Dental Association :—

It is cause of grateful acknowledgment to that Being whose eye is upon us all, and whose will controls the destiny of men and associations of men, that we are permitted once more to assemble in our corporate capacity to promote the ends, and cultivate the growth and improvement of a necessary and benign calling; to make another step in that progress which marks the age and distinguishes the other pursuits and professions of life. And especially should we recognize that mercy and benevolence which has watched over and preserved our lives amid the casualties and perils that beset us; and amid "the pestilence that walketh in darkness, and destroyeth at noontide." So far as we are informed, none of our members have fallen since our last annual assemblage, but all live to testify the infinite love and forbearance of that Sovereign whose creatures we are, and who holds our breath in the hollow of His hand.

It is also a peculiar satisfaction to witness the evidence of increased interest in the objects of our association, manifested by this presence. We see around us some of the old and honored representatives of our profession; the fathers of Virginia dentistry, the pioneers, guides and leaders, who struck the rock when we were in the wilderness of darkness and empiricism; who lifted up the rod, that the faint might look and again be strong; and who have at last brought us to a view of that promised land, where true science reveals a prospect enchanting as that which filled the eyes and gladdened the hearts of Israel's sons and daughters. We find here brethren in the prime and strength of manhood, with their faculties matured, their judgments ripened, and their confidence unshaken in the brilliant promise which awaits, and will reward our earnest and faithful labors; and here too, are our younger brothers with the generous impulses, the ardent enthusiasm and noble aspirations, which stir and animate our hearts, and nerve and strengthen our arms in every good word and work. It is no trivial subject or unimportant matter which thus attracts the presence, and commands the attention of such a body of men; and we again repeat the expression of our profound satisfaction, that we have assembled with unbroken ranks, and under auspices so favorable; and again may we repeat the acknowledgment of our gratitude to the Great Disposer of events, and invoke His guidance and blessing upon our transactions. And now, gentlemen, we confess we have been not a little embarrassed in selecting a suitable and appropriate subject for our annual address; and have with doubt and hesitancy chosen *Professional Excellence* as perhaps the best we could present for your entertainment and instruction.

As a general proposition, professional excellence implies a preparation, as thorough and complete as practicable, for the duties and offices of our chosen calling. As a profession, dental surgery is no longer an open domain, and the day has passed when men might somersault from the varied and

incompatible pursuits of life, and appear full-fledged professors and practitioners in our specialty of the healing art.

I shall not consume your time, or weary your patience with a portraiture of the "dark age" of dentistry, an age sombre and melancholy to contemplate; but here and there, relieved by some of the brightest examples of excellence that any department of science can boast; examples of genius, of energy, of patient, persistent application and research, which have written their names in imperishable characters in the annals of our craft, and built for them monuments as enduring as the records of science. Fouchard, the father of modern dentistry, Dellabarre, Desirabode, Bourdette, Bunon, Tenon, Le Foulon, Bichat and Blandin, of France; Hunter, Bell, Blake and Fox, of England; Greenwood, Hudson, Hayden and Gardette, of America, are all names which the dentist of to-day, and the dentist of the future, may safely accept as examples of an excellence most rarely attained. These men were all contemporaneous with the embryonic age of modern dentistry,—beyond a few suggestions and aphorisms of Hippocrates, a few allusions of the Latin poets, a few observations of Galen, and a more extended and respectable essay of the great old French surgeon, Ambrose Pare, nothing was known of the anatomy, physiology, pathology, or therapeutical needs of the teeth. There were no accepted theories, and no recognized systems or principles of practice; and yet, from the individual and almost unaided efforts of these men, system was brought out of confusion, and such light eliminated from the surrounding darkness, as to create the dawn of that day, in which it is our fortune to live. These were our early illustrators of excellence, who prepared the way, and heralded the advent of such teachers as Nasmyth, Owens, Goodsir, Richardson, Tomes, Beale, Arnold, Huxley, and others of England; of Raschkow, Retzius, Parkinge, Kolliker, Leber, Rottenstein and Wedl, of Germany; of Hayden, Harris, Arthur, Taft, Richardson, Piggot, Handy, Bond, and many others of this country, who have distinguished themselves as writers and

operators. And in passing, we may remark the singular and inexplicable fact, that during the last twenty or thirty years, France, the fatherland and birth-place of modern dentistry, has produced no distinguished writer or practitioner in our specialty; its very court and nobility being dependent upon American dentists for the services they require.

But to proceed with our subject. We have said that professional excellence demands as a primary condition, adequate preparation; and more than this, it requires a personal and individual adaptation to the peculiar nature of our calling. It may be accepted as an axiom, that relatively few men possess the natural endowments essential to excellence in any of the departments of surgery; as relatively few exhibit the attributes which constitute the poet or the painter. These qualities and characteristics, no amount of training, no degree of application, and no known system of education can ever secure; they may be cultivated and developed, but *never created* or *acquired*; and yet, they are indispensable to respectability, not to say excellence in all surgical practice.

A pure taste, a correct eye, a well adjusted nervous and muscular organization, a facile and cunning hand, which may be steady, firm and strong, or delicate and tender in its touch as the breath of a vernal morn, and an inventive faculty that will at once respond to all the exigencies and ever changing conditions of cases in practice, are some of the distinctive qualities of the dentist who may aspire to excellence in his profession; and no man wanting in these natural endowments should be encouraged to adopt any department of surgery, and least of all dental surgery as a profession. It is a fact, attested by observation, and confirmed by all experience, that while most men of average intellectual endowments and educational advantages, may make of themselves safe and efficient practitioners of medicine, it is only here and there that you find one who attains respectability or distinction as an operative surgeon. The

explanation is simple and manifest. The one possesses the requisite *natural qualities*, the other, wanting in these, can no more be educated into them, or have them educated into *him*, than you can educate the average man into the sculptor or the orator; and I repeat, that it is always a personal and professional misfortune that such should ever adopt dentistry as the business of life.

The dentist then must be a man of natural mechanical aptitude, of manipulative dexterity, and of artistic eye and correct taste. The requirements for the cultivation and development of these qualities, as well as for the anatomical, physiological and other departments of professional education *are*, or *should* now be fully met in the offices and laboratories of established practitioners, in the standard text books now so amply provided, and in the lecture halls, laboratories and infirmaries of the colleges. We can suggest no improvement in the present system of professional education if properly carried out, and faithfully illustrated by our college faculties; it is true, that expressions of dissatisfaction have lately been heard concerning the management of our schools, and the conduct of our "faculties of instruction." There may be faults and delinquencies, and there *are* imperfections which are common to all human enterprises that attach to dental colleges, but it cannot be denied that they are institutions of inestimable value, that they have done more than all other agencies combined, to give to dental surgery its present status among the liberal professions and its present consideration and esteem in society. And further, it cannot be denied or gainsaid that our Professors and college faculties have been generous, laborious and self-sacrificing, and as a general thing are an unrequited and uncompensated set of men. Whatever faults or imperfections may now challenge our criticism, dental surgery owes a debt of gratitude to these institutions which has never yet been paid. The period of pupilage may be too short—we think it is; the standard of proficiency for graduation may be too low; the struggle for sustaining patronage

(owing to an unfortunate competition, incident to the unwise multiplication of colleges,) may have given ground for some of the strictures and animadversions these schools have received. But admitting all that has been charged, it is simply an *abuse*, which in nowise touches the principles, or impairs the system upon which these institutions were founded; and we may rest assured that whatever errors or imperfections may now exist, will be speedily corrected by a wholesome professional sentiment, which no school can resist and live. Our colleges *must* meet the demands of the age, or go down and be succeeded by others in harmony with the times, and measuring up to all the duties and responsibilities of advanced and advancing science.

Dental surgery has made in the last thirty years most wonderful strides,—in three decades, more has been accomplished than in all the preceding *centuries*, from *Hipocrates* and *Galen* down to the days of Greenwood, Hudson, Harris and Hayden; so that we do not perceive the necessity, or recognize the advantages likely to result from a change, or from any radical modification of our present system of professional training. But highly as I appreciate our educational facilities, and earnestly as I would commend the advantages they present, I am proud to assert, that some of the brightest exemplars of excellence in dentistry, achieved that excellence and distinction without such aids and helps. Hudson, Hayden, Parmley, Roper, Gardette and Maynard, with others who might be mentioned, wrought for themselves imperishable names through their individual and almost unaided labors; neither of these men, so far as we are informed, ever having matriculated in any other than academic schools; and I have the honor and satisfaction of addressing members of the Virginia Dental Association, who have without the help of colleges or Professors, earned by the force of genius, and the exhibition of personal energy and determination, positions of eminence and awards of distinction, which the proudest may court and the more favored may never reach or attain.

But, complete and thorough as may be our preparation for dental practice, fortunate as may have been our circumstances and surroundings in this regard, we have simply laid the foundation upon which we may subsequently build an enduring monument of character and reputation; we have but learned the alphabet of that language which, by diligent study and cultivation, will unfold to us the beauties, and unlock the treasures of that excellence for which we would have you strive. A determined purpose to faithfully use the knowledge and employ the resources we have already acquired, to increase that knowledge and multiply those reresources, must be our animating spirit and controlling desire. Keep abreast with the advance of science, read carefully the current literature of the profession, study closely the new standard works as they appear, investigate the theories, and analyze the systems of practice as they are introduced, appropriate and make our own every improvement and every valuable discovery, and make them all the better and more valuable to humanity for having passed through our heads and hands. Accept freely, and give generously all that we, or our fellow laborers in the field may invent, discover or create. Never permit our interest to abate, or our efforts to relax while a single theoretical problem remains unsolved, or a single practical question is undecided. It is the saddest era in the life of a professional man, when he concludes that he has nothing more to learn; that he has mastered all the requirements of his calling, and compassed all the resources of his vocation. With *that* moment begins his decline in progress and usefulness, and *with* that moment ends all rational hope of future excellence or personal distinction.

Why fellow members of the Virginia Dental Association, the most familiar expression of disease which the dentist is required to combat—caries of the teeth—is even now enshrouded in mist, and fog, and uncertainty as to its cause, progress and final result. Who can with certainty tell us after a century of research, aided by all the appliances of

modern science, the *exact* cause or causes of decay of the human teeth? We are familiar with the various theories which have from time to time formed the basis of practice with our best men; but we have seen these theories one after another fade out, melt away, become modified by new revelations, or utterly and wholly repudiated in the light of subsequent experience and observations. The chief duty and most important office of the dentist is to *save* the natural teeth, and if we knew *exactly* what caused decay and destruction of these organs, and precisely and certainly how that cause operated in all cases, with our present knowledge and resources, it would be a *short* step to discover the means of counteracting that cause, and preventing its ravages in dental tissue. But with all the labor and all the research, with all the aids of advanced physiology, of analytical and synthetical chemistry, with all the wonderful revelations of the microscope, the cause and methods, so to speak, of decay of the natural teeth remains an undetermined and perplexing question. One will tell you that this cause is local; another, that it is general or systematic; one, that it is external; another, that it is internal; one, that it is mechanical; another, that it is chemical; and still another, and we think a more rational theory is, that it is chemico-vital; one, that it is acids; another, that it is alkalies in the oral and buccal secretions, and more recently, the disclosures of the microscope would seem to warrant the conclusion, that animal and vegetable parasites, animalculæ and infusoria, play a very active and decided part in the process of dental disorganization and decay. I merely mention this single example, lying upon the very threshold of our specialty of science, as an illustration of the necessity for continued and persevering effort on the part of all who would achieve excellence as dental surgeons; and the stupidity and folly of any man in our profession who would persuade himself that he knows enough to cease his labors, and rest upon his present attainments. But the timid and the weary ask, what chance is there for us? What need of our worrying our brains with

that which has baffled the efforts, and defied the research of scientists for a century or more? Why, simply this; that every step is an approach to truth, though in itself a failure, though disappointment may result, and though we may at times appear in a certain sense to be wandering away from the object sought; in another, and *stronger sense*, every additional step is an approach to the desired end, upon the principle or the philosophy of the hunter, whose flagging companion, after beating the fields and finding no game, urged the abandonment of the hunt. "No," said the keen old sportsman, "I know there *are* birds; we *now* know they are not in these fields; let us look elsewhere, and we will find them." We know that human teeth decay, and myriads of these invaluable organs are annually lost, we have beaten many fields in the vain pursuit of the cause of that decay and loss; let us now look elsewhere, and continue the search till success rewards our diligence and perseverance, and we finally reach a solution of this great and important problem.

In this connection I would earnestly commend the value and importance of physiological study and investigation and of histological research and examination; for while no absolutely certain or definite results have yet been reached through these agencies, yet, from the startling revelations which have rewarded the labors of the physiologist, the chemist, and the histological anatomist, we are led to the reasonable hope, that through the microscope, through the crucibles and retorts of the laboratory, and the persevering investigation of the elements and germs of matter, and the combination and development of those elements and germs into tissues and organs, perfect in *form*, *composition* and *functions*, that we *may* at no distant day have unfolded to our view, not only the secrets of vital organization, but the true and complete explanation of disorganization and destruction of the special organs of the human body, committed to our care and preservation; and just here, I would bring to your notice, and commend to your earnest attention, "Richardson's Hand Book of Medical Microscopy," and

"Tyson's Cell Doctrine," a work of great interest and value to the dentist, for it is really what its title indicates, "a *resume* of all that has been written by Virchow, Robin, Huxley, Hughes, Bennett, Beal, and other distinguished microscopists and physiologists." Tyson has also recently published a small work, "an introduction to the study of practical histology for beginners in microscopy," that is of great value to dentists who are new to this subject, and who are unfamiliar with the qualities and practical uses of the microscope.

If we would attain excellence, I repeat, we must be diligent students, patient investigators, and accurate observers, so long as we assume the responsibilities, and essay the duties and offices of special surgeons. Our current literature should be closely scanned, and our standard works, both American and Foreign, should receive our critical attention ; and our own discoveries, inventions and improvements, should be carefully noted, and generously given to the cause of science and the interests of humanity.

[TO BE CONTINUED.]

ARTICLE II.

Neuralgia of the Trigeminus.

A Thesis presented to the Faculty of the Baltimore College of Dental Surgery, by Miss Louise Jacobi, for the degree of D. D. S.

I have selected the Neuralgia of the Trigeminus as the subject of my thesis, because with that nerve the dentist has most to deal, and should therefore, I consider, be well acquainted with all its normal and abnormal functions; and, further, because of a lack of a thorough knowledge of the nerve and its diseases, many teeth which could be saved for a long time, are sacrificed without affording the patient relief from suffering. I confess, in the beginning, that in many cases the characteristics of Neuralgia of the Trigeminus are not so clearly marked, that the dentist can always

judge precisely, and often a very imperfect idea of them in some kinds of Neuralgia can be formed. But we are, however, able in the present advanced state of science to become so well acquainted with the subject, by proper reflection and careful examination, as to avoid many mistakes. We are greatly indebted for our knowledge of these subjects to the invaluable works of Charles Bell, Romberg, Valleix, Schuh, Wagner, Eulenberg, Benedict and others.

Having thus briefly stated my reasons for selecting the subject of my thesis, I now propose to speak directly of Neuralgia of the Trigeminus, and first to give the opinion, that it depends in every case upon a more or less delicate pathological change, (to which I will refer hereafter,) and when in the course of this thesis I speak of the symptoms of the disease, I will bear in mind that they are dependent upon this change.

The definition of Neuralgia could not up to the present time be given from an anatomical basis, and there was, therefore, a necessity to explain the disease from its symptoms; but as the symptoms do not show themselves in the same way in every case, the definition is varied by different authors. Bardeleben says: "Since the time of Chaussier the name of Neuralgia has been given to the hyperesthesia of the sensitive nerves, which shows itself in pain of great intensity in the course of a certain nerve." (*Bardeleben, Lehrbuch der Chirurgie und Operationslehre, II. Band, 6te Auflage, pag.* 302.) Bardeleben also says in his Aetiology, that the wounding of a nerve, pressure upon it from a tumor, or from any mechanical cause may result in Neuralgia. But according to Niemeyer, Neuralgia is a complication of symptoms, which does not always depend upon constant anatomical change. The definition given by him in his Aetiology is as follows: "When a blow, high or low temperature, or other injuries which strike the peripherial terminations of the nerves produce pain, or pain is produced by inflammation or diseases of the skin, the mucous membrane, or the parenchyma organs, we do not speak of it as

Neuralgia. But when we cannot take the irritations which have acted upon the peripherial terminations of the nerve as the cause of the pain, or it is probable that the irritating cause has acted upon the trunk itself, we call the pain then found in the extension of the nerve, Neuralgia." Mears, after speaking of some of the symptoms of Neuralgia, gives the following definition: "This painful condition existing in a nerve, is called Neuralgia. As it depends upon no constant anatomical characters, it cannot be defined as a disease. It is a combination of symptoms, and the causes which are engaged in its productions are various." (Trifacial Neuralgia, in the *Dental Times*, January, 1873, No. 3.) Other authors speak in the same way of the definition of the disease. It would require too much space and time to go further into this branch of my subject, and I therefore refer to the works of the acknowledged authors, and especially to *Romberg's Nervenkrankheiten*. *3te Auflage*, *Berlin*, 1857, and *Valleix's Traite' des Neuralgies.*

The word Neuralgia comes from two Greek words, which mean nerve and pain; I adopt the meaning of the latter word, and call every pain in the nerve, no matter from what source it may arise, Neuralgia. Although I thus set for myself wide limits, I draw at the same time a distinction between several varieties or kinds. Every pain which is reflected in the nerve must not be confounded with Neuralgia, for the nerve then is only the physiological conductor, as in other forms of sensitiveness, and the conducting power, not the physiological part is afflicted, while in Neuralgia the nerve shares immediately in the affliction. But this sharing of the nerve in the pain could not always be proved by observations of anatomical change; as we up to the present time have derived our information of Neuralgia from the symptoms.

Symptomatology.—Neuralgia shows itself in most cases in so marked and peculiar a manner, that the practitioner can readily recognize it after having several times observed it; and yet, it does not remain so monotonous as might be at

first inferred. Onthe contrary the pain manifests itself in many different ways; sometimes it is piercing, then again burning, itching, pricking, etc. It is strongly characteristic of the pain that the patient does not fix it at a certain point, but confesses its extension over a considerable district or region. The physician consequently finds the real aching point much smaller than the sufferer believes and states. Sometimes the pain radiates along the whole course of a nerve, according to the seat of the disease. Sometimes the pain radiates from one point of the nerve either to the periphery or to the centrum.

According to the direction of the pain Neuralgia has been divided into two kinds, ascending and descending. Valleix discovered first what he calls the points *douloureux* which show on pressure the most intense pain. But other authors have not always found these points, and they have been attributed to anatomical situation, of which I will speak under the head of anatomy.

Sometimes the localities of the pain are quite normal, but they are at other times pale, or redened, or swollen. The skin is at the point of pain a little stretched and dry, or relaxed and covered with a cold perspiration. Sometimes, also, the secretions of the mucous membrane and other glands which are connected with the afflicted nerve, increase, but the secretions seldom decrease. If the nerve is a compound one, the pain is often accompanied by convulsions. Often fibrilæ convulsions attend the disease like creeping sensations, as of the creeping of ants. On the other hand, there is also a feeling of relaxation, deafness, bluntness of teeth, observed with Neuralgia of the Trigeminus, conditions which arise from a depression of the sensibility. On account of the Neuralgia, there are in the region of the Trigeminus, exanthemes, as herper zoster developed; for instance, on the inferior maxillary, on the neck and in the clavicle part in which are found single branches of the fifth nerve.

The pain comes in paroxysms, which last only for a short time. They succeed each other sometimes very quickly

and are very intense; they have an injurious influence upon the part in which the afflicted nerve is situated, so that it becomes often subject to atrophy or hypertrophy. This bad influence will by and by extend to the whole organism, and render persons of the most amiable tempers, morose and unbearable. Before an attack the patient may be either quite free from pain, or it may diminish in intensity so much that business can be resumed, from which the patient has perhaps been detained by the severity of the pain. The diseased parts become so stimulated, that their functions may be no longer normal; they may even become suspended. These paroxysms can be produced not only by the original cause, but by an accident, which may influence the diseased nerve. Trouble of mind is apt to produce them.

I have enumerated a sufficient number of the characteristic symptoms of Neuralgia. I will now endeavor to explain some details, keeping in mind, however, the one subject of my thesis.

Aetiology—Having considered the causes of Neuralgia, I desire to speak of the many conditions which will produce it. These conditions are so various, that they sometimes have no relation to each other, and yet they produce Neuralgia of the same form. The cause cannot always be determined; it is very probable that there is a delicate change of the fibrilæ of the axen cylinder, etc., which we are not able to observe with the naked eye, or even with the aid of the microscope. The same delicate changes may be supposed to exist in similar cases of nervous diseases. The real cause of Neuralgia is still wrapped in darkness, and on that account other causes are erroneously confused with it. After a while, Neuralgia seems to free itself, so to speak, from the originating causes, and to become independent of them, and often on this account the real cause remains undiscovered. Among the first ætiological causes of the beginning of Neuralgia, are the following:

Liability to Neuralgic attacks varies with the individuality of persons, but those predisposed to it are they who have an

excess of nervousness, have anæmy, or are of scrofulous diathesis, or are very susceptible to changes of temperature. Most women between the ages of 30 and 50, are predisposed to Neuralgia. This fact cannot at present be explained. An explanation may be found in the greater nervous vital power, or in a subjective hysterical sensitiveness, which are oftener found in women than in men and children. The greatest attention to hysterical symptoms is necessary, as from them Neuralgic pain often originates in the form of toothache. We ought also to pay the greatest attention to rheumatic Neuralgia, with which we meet very often, because when it attacks the Trigeminus it produces the most violent toothache. Arthritical Neuralgia does not often exist; it belongs to rare cases. Other constitutional diseases, such as syphilis, may produce Neuralgia. For constitutional causeswe can add those coming from infections and poisonings, as with malaria. They are often followed by Neuralgia of the first branch of the Trigeminus. Neuralgia has also been observed in cases of typhoid fever, but not very often. It is difficult at the present time to explain how it happens that these fever diseases are followed by Neuralgia. But it is not so hard to explain the poisoning with lead, phosphorous, mercury, copper, etc., because the cauterization of the mucous membrane by those poisons may be the first ætiological cause.

The local causes of Neuralgia of the Trigeminus are to be found in the centre, in the course, or in the periphery of the nerve; they can be caused by pressure, by the thickening of the surrounding bones, exostosis on the bone or teeth, neuromen, cancers and other tumors, as hæmorrhagien, extravasats; also, inflammation of the parts in the neighborhood, inflammation of the sheath itself, irritation of the nerves by foreign bodies, twitching out by contracted scars, irregular and unequal distribution of blood, injuries, wounds, taking cold suddenly from a draught of air, long exposure to damp air, or the coldness from clothes often wetted by perspiration. Certain conditions in certain individuals are

sometimes followed by acute Neuralgia, which comes and goes with the conditions themselves. To the causes already mentioned must be added those with which the dentist most often meets, namely, the caries of the teeth, and the chronic inflammation of the pulp or periost, hypertrophy of the cementum on the apex, which presses the nerve upon its entrance into the tooth, or thickening of the periost and mucous membrane of the antrum can produce Neuralgia in the superior anterior dental nerves, even when the teeth are sound, (Schuh.) Abnormal dentition, inflammation of the nerves of the gums during the cutting of the wisdom teeth, also the extraction of teeth, when not done in the most careful way can produce Neuralgia—(Wedl.) These are the mary causes which oftenest produce Neuralgia, and therapentics are used with success as they are discovered.

Anatomy.—Of all nerves the Trigeminus is most subject to Neuralgia because of its anatomical situation. It is a componnd nerve, consisting of two roots, different in their nature; the posterior, larger and sensitive one, originates in the *corpus restiforme*, and the *oliven* (*portio major;*) the anterior, smaller and motor one, originates in the *sinus rhom, boidalis*, (*portio minor.*) This nerve is after the formation of the *casserian ganglion*, which is much like the ganglion of the sensitive nerves of the spinal cords, chiefly formed by the sensitive root,* is divided into three branches, and on that account takes the name of Trigeminus or Trifacial nerve. They then go through bony canals. Neuralgia may be often attributed to this anatomical condition, and the least pressure upon the nerve will produce it. That this is a fact is proven by the successful excision of that part of the nerve exposed to pressure. This pressure upon the nerveby the bony canals can become active by the narrowing of the canals caused by the swelling of the bone, exostosis or inflammation of the lining membrane; or passive by the thickening of the nerve itself, or its excited sensibility.

*According to Shilling the sensitive fibres enter into the posterior columns, and the motor one into the anterior columns of the spinal cord.

Pressure upon the nerves may also be made in soft canals, as the fascias, through which the branches of the nerve pass, and by which they are sometimes more or less laced. The points *douloureux*, named by Valleix, are to be found in those canals, or to speak more accurately, in the foramens. In the Neuralgia of the three branches of the Trigeminus, it is very interesting to observe that these painful points are nearly always in the face in a line corresponding with the bony canals through which the branches of the nerve pass. The canals also effect the regular division of the blood, and so produce neuralgic pain. Until the blood gets from the veins of the spinal cord to the cava superior, it takes on the left side an indirect course, as it goes from the V. Hemiazigos into V. Azygos. The least resistance here causes the veins to over-fill, and Henle explains that this is the cause why intercostal Neuralgia is found oftener on the left than on the right side. From this predisposition of the left side. Henle draws the rational and ingenious conclusion, that the vene plexuses, which are in the neighborhood of the nerves, in passing through the above mentioned canals are over-filled, and thus exert an important influence upon the origin of Neuralgia. Henle also gives the opinion that the disease may be produced by the veins accompanying the nerves; he thereby explains the fact that the first branch of the Trigeminus is more subject to it than the second or third ones.

These are the anatomical conditions, which predispose certain nerves to the disease, and we may hope that in future we may gain more satisfactory explanations of the predisposition of individuals. Up to the present time the pathological anatomy has only given us in some cases such lesions as may be taken as causes. We have not yet been able to make a strict scientific division of Neuralgia either ætological or pathological anatomical. I do not think we are justified in dividing Neuralgia into two kinds, a pure or real one, when no cause can be stated, or unreal or impure when a cause can be found. We call Neuralgia descriptive or topographical-anatomical, and specify it after the diseases

which it follows; sometimes also in reference to the causes which we are able to state. An irrational Neuralgia, if I may use such an expression, is that which has special reference to that in which we find anatomical lesions. Pathological anatomy can only show this lesion, but about idiopathological Neuralgia the anatomist has not been able to state anything. It is not well to believe that Neuralgia can exist in which the affected nerve retains its normal nature, and performs its normal functions. I think there must be an abnormity in its nature or in its chemical composition or vitality, which causes the disease. This abnormity can depend upon the different conditions of the nerve. The fibres may be atrophied or respectively hypertrophied, or the constituent parts may be in disproportion. We know from experiments that the least quantity of water first stimulates the nerve and then reduces it. Relaxation may follow excessive irritation of the nerve, and this may produce a thickening of the white substance of Swan, which presses then upon the axen cylinder and prevents it from performing its normal functions. A great many anatomical causes and explanations may be theoretically given, but they lack experimental proof and scientific basis, and up to the present time we look in vain to the experimental and cell pathology.

We are not able to determine if there be special pathological conditions of the ganglien of the Trigeminus which may be the cause of Neuralgia. But we know that they take a share in it, because we are able to determine the seat of the affection in certain cases by the functions of those nerve fibres which enter into them and which are experimentally fixed and explained by Magendie.

The alterations of the parts provided by the diseased nerve have been already refered to, and will be hereafter spoken of. I will only mention that in Neuralgia of the Trigeminus, the gums become spongy and bleed easily, that sometimes the teeth fall out; also it has a bad influence upon the eyes. As yet we have not obtained any certain observations of changes of the hair, which might be expected from the

connection between the hair and teeth. Prof. Virchow spoke of such a connection in his speech about the wild men of Russia. *Berliner clinische Wochenschrift*, 21 *Juli*, 1873, *No.* 29. This connection is also found in cats; the fibres of the Trigeminus enter into the beard and render it very susceptible to the touch.

Some diseases, which may be followed by Neuralgia and have an anatomical pathological lesion, as inflammation, degeneration, tumor etc., have been spoken of, and I will now refer to only one anatomical condition, which according to Niemyer, even when only hypothetical, is very probable. He gives the opinion that rheumatic Neuralgia is based upon hyperæmy and an œdomentous swelling of the neurilem, which disappears after death. Benedict says in reference to the *tic douloureux*: We conclude from the isolated appearance of pain in the Trigeminus, and also from irradiating connections to the sensitive fibres of the muscles of the nerve facialis and the motor parts of the Quintus, that the *tic douloureux* is chiefly an affection of the Trigeminus nucleus and is also an intimate connection with the diseased condition of the sympathicus; and the results which are obtained by the compression and underbinding of the carotis refer generally to a chronic hyperæmy as the anatomical cause of the greatest probability.

Diagnosis.—It is by no means easy to make a diagnosis of the disease, because a plain but violent pain may falsely appear to be Neuralgia. We must therefore not be too ready to make a diagnosis of Neuralgia, if we have a patient who complains of pain in different places at the same time. The statement of the patient is only of value to the physician as it corresponds with practice and observations. A still greater care in a diagnosis is necessary, if we recognize a nervous disease with anatomical pathological condition which can be connected with Neuralgia and yet separated from it. I mean neuritis which has many special symptoms, but also many in common with Neuralgia. The characteristic symptoms are of great value in making a right diagnosis. It may

therefore be here spoken of in comparison with those of Neuralgia. In neuritis we can establish always a positive lesion, which cannot always be done in Neuralgia. The course of neuritis is most acute,—that of Neuralgia most chronic. Neuritis does not as often end in paralysis as the latter. In acute neuritis the pain is without intermission, increases and does not change its character; in Neuralgia the pain is like a flash of lightning—now burning, then again piercing, etc. The neuritic pain will increase under pressure; the Neuralgic will not. The skin above the inflamed nerve is always red, burning hot and a little swollen. The nerve itself is sometimes a little swollen. But in the Neuralgia all these symptoms do not come so constantly to our observation. The result of Neuritis shows itself at the first beginning in the parts to which the inflamed nerve is distributed; then according as the nerve is a sensitive, motor or compound one, its conducting power is destroyed. In Neuralgia this can only occur after a long continuation of the disease. Along with Neuritis or after it, Neuralgia may develope and continue. As Neuritis can develope Neuralgia, so too Neuralgia can develope Neuritis. Neuritis may be, perhaps, an advanced step of a kind of Neuralgia, but they are under the present view of them, strictly separate. Neuralgia can also be complicated with other diseases, to which we must pay attention in determining the diagnosis. To refer more particularly to all possible complications would necessitate too great length.

To the symptoms of Neuralgia, already mentioned in Symptomatology, has been added in the Aethiology, the nature and original characteristics of the disease. We have now to determine the seat of affection, and this must be done after the observation of the symptoms. If the affection be a central one, that is, on the place where the nerve originates, all three branches of the Trigeminus are affected, but if the affected part is in the continuation of the nerve, one or two branches may be affected, and the other remain intact. We have not only to examine the

sensibility and motor action, but at the same time to specially examine into a great many actions, which the Trigeminus, according to the experiments of Magendie, Budge, Valentine, Romberg and many other authors, performs during its course, and by finding an abnormity in them, we are able to determine the locality of the affection. This shows us that after thorough consideration of the complicated activities of the Trigeminus and other phenomena, we are able to make a diagnosis so accurate that one, not familiar with the whole nature of the nerve and the disease, would not be able to do. The more the affected point is peripheral the easier is the diagnosis, because the symptoms are then not so complicated as when its seat is central.

In Neuralgia of the first branch (*neuralgia frontalis*,) the patient complains of violent pain, beginning in the *fissura orbitalis* and radiating to the surrounding parts. Sometimes pustules and other exanthema are observed on the forehead. The upper eyelid is a little swollen, and during the attacks hangs down. The arteries beat, the eye is red, and the secretion of tears increases. Half of the nose is also affected.

In Neuralgia of the second branch (*neuralgia infraorbitalis*,) the pain comes suddenly and very violently from the *foramen infraorbitalis* to the under eyelid, the upper lip, the nose, and the teeth of the upper jaw, so that it is often mistaken for tooth-ache. During the attack, the skin is a little red and swollen; the pain is often so violent that it has a bad influence upon the whole organism, and this is increased by the disturbance of the functions of those parts supplied by the second branch, which are generally more actively employed than those parts supplied by the other branches. Convulsive movements of the muscles of the face are also observed, together with an increased secretion of saliva.

The Neuralgia of the third branch (*neuralgia maxillaris*,) affects mostly single branches of it, and rarely the whole branch. In former times the mistake was made of taking

Neuralgia of the Trigeminus for Neuralgia of the facial nerve, when in reality some branches of the maxillaris inferior were affected, which anastomose with the facial nerve behind the lower jaw. In the same way Neuralgia of the auricularis anterior was mistaken for facial neuralgic pain, and of course the cutting of the facial nerve did not give any relief. This method of cutting the seventh nerve can be traced to the times of Valpeaux, and even to a later date. We could not now make that mistake, because physiology has taught us that the facial nerve is purely a motor one. The mistake was made because the two nerves anastomose as before stated; and the pain irradiates from the Trigeminus to the parts supplied by the facial nerve. If the alveolaris inferior is affected, the pain locates itself mostly on the outer part of the lower jaw and chiefly around the foramen mentale, extends to the lower teeth and the whole half of the lower jaw. In the year 1872, I enjoyed the opportunity of observing a very interesting case in the clinic of the Pennsylvania College of Dental Surgery, in which the alveolar border of the left superior maxilla and the alveolus, and body of the left side of the inferior maxilla were affected, producing constantly recurring paroxysm of pain. The sufferer was an Englishman, 78½ years of age, who had suffered 38 years from Neuralgic pain. He had consulted physicians, but without relief. When he entered the clinic the Neuralgia was very intense, and he could not bear the least touch. The disease was produced by a thickening of the alveolar border. Prof. Mears removed the alveolar ridge and the operation gave the patient much relief. An extended account of the case is to be found in the report of Prof. Mears in the *Dental Times*, No. 3, 1873.

Comparing the Neuralgia of these three branches, I come to the following conclusion: Neuralgia of the first branch is most often met with in consequence of its anatomical nature; that of the third branch is the most infrequent; and Neuralgia of the second is the most intense, and therefore the most burdensome to the patient, causing excruciating pain.

Neuralgia *frontalis* gives the least trouble and pain to the patient.

It has been already said that Neuralgia is mostly of a chronic nature. The Aetiology has a great influence upon the course of the disease. Malaria Neuralgia is of an acute character. Except the paroxysm, Neuralgia is not equal in its entire course, remissions and exacerbations may be observed. The cause of this we do not know. Dry, bad and damp weather, and also the surroundings and humor of the patient, have a direct influence upon the remission and exacerbation. We know of malaria Neuralgia only as a regular type of attacks; but in other cases the paroxysms may be produced whenever an opportunity occurs. According to Niemeyer, the intervals between the attacks may be explained by the well known physiological fact, that a great excitation of the nerve exerts its excitability for some time, so that in Neuralgia the highest excitement changes with the exhaustion of the excitability of the nerve. In favor of this opinion of Niemeyer, is the fact, that after violent attacks the peripheral terminations of the nerves are for sometime to a certain extent without sensibility to external provocatives. It has also been observed, that after an attack has been produced by continual pressure upon a painful point, a repetition of it has not the same effect. Though this opinion of Niemeyer is an ingenious one, it does not fully explain it; this problem can only be theoretically explained, until the real cause of Neuralgic pain is known. This pain is connected with the abnormity in which the nerve is; it is then of no importance if the cause is the anatomical condition, the vital power or the chemical composition of the nerve. This disturbance in the phase of life in the nerve must have an external cause, and it leaves behind a predisposition to the attacks of the disease, even when a cure has been effected. This is the same as with catarrh of the stomach, intestines or bladder; if once there it will return upon the slightest provocation.

From what I have said it will be seen that the Neural-

gia not being of a fatal nature, seldom terminates in a radical cure; of course, with the exception of malaria, rheumatic Neuralgia and cases of the same kind, which have an acute course. The prognosis accomodates itself to the ætiology. When the causes are known, and of that nature, that one can act upon them either surgically or therapeutically, the prognosis is easy; but in cases where the causes are not known, the prognosis cannot be determined. The general health of the patient is most important to the prognosis, and in some cases the greatest attention must be paid to the treatment for general health, because it is often the primary disease, and Neuralgia only the secondary. The prognosis depends then upon the nature of the constitutional disease, and is more favorable the younger the patient, and the more recent his illness. Even when there is no real danger of life, the disease is most burdensome and painful to the patient, making him low spirited, and giving him a great predisposition to other diseases, which may cause death.

Therapeutics.—I fear it would lead me too far, were I to dwell here more fully upon the therapeutics, and characterize the different remedies according to the effect they have in the present case; therefore I will speak only of the principles to be acted upon in the treatment of Neuralgia. The treatment of Neuralgia can be both medical and surgical, but must refer to the ætiology, and especially in Neuralgia of the Trigeminus; without such reference all remedies will be without result. The medical treatment must, if possible, act upon the primary causes; for only by detecting them can a radical cure be made. In cases of constitutional Neuralgia, which are produced by malaria, syphilis, hysteria, or other primaryca uses of that kind, specific remedies must be used; for Neuralgia from malaria, quinine; from syphilis, *kali jodatum* ; from hysteria, preparations of valerian, etc These remedies do not forbid local treatment, but it must be used only as a help.

The indications which show themselves under treatment are numerous. First, all external irritation must be avoided.

This will be accomplished by covering the afflicted part with a proper substance, oil being the best. There should also be as much rest as possible, because the movement and use of the afflicted parts will often produce attacks. When the causes are known, the treatment must always be directed to a removal of them, but as they vary, the treatment must vary. If the cause is not known, then remedies such as experience teaches are proper, must be used, and the practitioner must accommodate the remedies as much as possible to the special cases. Attention must also be paid to the course of the disease; if it is acute, then those remedies which act, so to speak, acutely are to be applied,—they are vesicants. The application of hot and cold water, aconite, camphor, veratrin, etc., with short continued use are among the acute remedies. Bleeding must be resorted to with great precaution, and only after mature consideration. The treatment is much more difficult when the disease is chronic, because its place is then secured by long occupation, and the most radical remedies can only act very slowly, and sometimes without any result. In most chronic cases the benefits of watering places are often great, and the waters of Gastein, Rehme, Wildbad, Baden and other places, have a high reputation. Sulphur baths, and preparations of sulphur, are of great service in cases of Neuralgia from mercury, copper and lead poisoning, or from rheumatism—moor and salt baths and sea bathing are also of much service. They must be supported, however, by medical treatment, to result in benefit. The remedies used in chronic cases must be long continued; they are arsenic, salicium, therebenthin preparations of zinc, *hyoseiamus* in pills. Carbonate of iron is also used with benefit in cases of anæmy and other weaknesses. Petroleum, ether, chloroform and opium are also beneficial. Among all these narcotics, morphine is of the greatest value, giving the patient speedy relief, by which it gains at once his confidence. Some use it as a secret remedy. A subcutaneous injection of morphine gives in all cases temporary relief, if not a permanent one. I recall here a case which was

related to me. A lady, aged 36, had suffered for seven years from prosopalgy, and at last the pain increased so powerfully that her physician, who had exhausted many remedies without any beneficial result, took her to a Professor, whose name I do not feel authorized to give. The Professor agreed with the physician that the sufferings were caused by Neuralgia of the second branch of the Trigeminus, and recommended the subcutaneous injection of morphine. The first application gave much relief, and at the expiration of three weeks, a radical cure had been affected. This fact, communicated to me by a reliable person, shows that the subcutaneous injection of morphine can be used with great benefit, even when the causes are not known. Another important remedy remains to be mentioned, namely, electricity. This is also an aid in making a diagnosis, by reason of the reflex action of the muscles, which it produces, and the affected nerve can then be better located. The therapeutical value of electricity shows itself in a great many kinds of neuralgia. In some cases the inductive current acts; in some the constant current. How the electricity acts we do not yet know. I can not here enumerate all the probabilities which may be given for it; I refer, however, to the books upon the subject, and especially to the works of Benedict. When electricity is applied, the seat of the disease must before be accurately determined, then only by treating the *locus morbi* can we get a result. With much truth, Benedict says: "Unless the locality of the disease is known, the electhro-therapeutic is of very little value."—(*Benedict Electhrotherapie*, *Leipzig*, 1868, *pag.* 91.) Benedict treats Neuralgia of the Trigeminus in the following manner:—In Neuralgia of the second and third branches, he puts the copper pol behind the ear, and the zinc pol upon the *puncta dolorosa.* When the first branch is affected, the copper pol is generally placed upon the neck, and the zinc pol also upon the *puncta dolorosa*, or its radiations. In the majority of cases between 14 and 20, applications produce an effective cure, and sometimes sooner. If no relief is given at the beginning, then a continuance is not indicated.

Many reports of the curative power of electricity are to be found in the casuistic of the works of Benedict on electhro-therapeutic.

If one is sure, theoretically and practically, that therapeutics can give no relief, surgical treatment must be resorted to. This differs much in different cases according as the disease has itself originated. To present it in brief, the surgical operations may be divided into two groups; first, those in which the nerve itself is cut; and second, those in which the surrounding parts which press upon the nerve, are removed to relieve the nerve. I might here mention those cases in which only a surgical operation can give any hope of relief, but it would necessitate too great length, as I would be obliged to discuss the nature, the course and the characteristics of those cases.

In idiopathic Neuralgia, either Neurotomy or Neurectomy are used; the first consists in the cutting of the nerve, the other in the removal of a piece of the nerve. These operations are performed by different methods, and recommended by celebrated surgeons, as Langenbeck, (*Die subcutane Durchschneidung des nervus infraorbitalis in der fissura orbitalis inferior, Archiv. fur die clinische chirurgie, Band XI., pag.* 127.) Schuh, (*Uber die Gesichts Neuralgien und uber die Erfolge der dagegen vorgenomenen Nerven resectionen, Wien*, 1858.) Linhardt, (*Compendium der Chirurgischen Operationslehre, Wien*, 1868.) Wagner, Vidal, Carnochan, Pancoast and others. Neurectomy is to be preferred in so much, that it gives a more certain satisfactory result, because when the nerve is only cut it easily heals. I refer again to the surgical works for information as to the manner of performing the different operations, and I close with the wish that the future may remove all that is problematical about Neuralgia of the Trigeminus, and take it out of the regions of symptomatology.

And in conclusion I return my most sincere thanks to the learned professors from whom I have had the honor to hear lectures. They may observe in this thesis the fruits of their patient and courteous instructions.

SELECTED ARTICLES.

ARTICLE III.

Traumatic Phthisis.

BY C. F. BEVAN, M. D.

Demonstrator of Anatomy and Lecturer on Osteology in the College of Physicians and Surgeons, Baltimore.

Within the last few years, the general pathology and doctrines respecting Phthisis Pulmonalis have undergone many and marked changes. The views of Lennec, "that *every* form of phthisis pulmonalis is caused by a *specific new growth*, and that the cavities in the lung take their origin *alone* in softening and the evacuation of this growth," are no longer considered tenable. They have been too frequently refuted to need comment or explanation here. Still, though we do not accept the *specific new growth* theory as a whole, we are far from rejecting it entirely. That miliary tubercles are sometimes found, is acknowledged ; yet these miliary growths form by far the smallest percentage of all consumptive cases. Nor are we willing to admit that "almost all the alleged miliary tubercles of the lungs are bronchitic, peribronchitic and pneumonic deposits," even when endorsed by Virchow. It is by no means an unfrequent occurrence to find both the yellow caseous deposits, and the small, granular, miliary growths or tubercles associated in the same lung, as well as scattered throughout the system at large.

The beautiful views of Niemeyer, assigning the majority of consumptive cases "to consolidation and destruction of the lung from pneumonic processes, especially chronic ca-

tarrhal pneumonia," are now almost universally received. The morbid changes resulting from the pneumonic processes, viz: consolidation of the lung tissue, in a mechanical form, simply by an increased proliferation of young, indifferent, undeveloped round cells filling up the alveoli and undergoing cheesy metamorphosis, account fully for the pathological lesions found. But whether we accept the specific new growth theory, or that the alleged miliary tubercles are bronchitic, peribronchitic, or pneumonic deposits; or whether we accept the views of Niemeyer, different as they are in their pathology, yet in one respect at least they all agree, viz: that *all* cases of phthisis pulmonalis commence with lobular induration, and end in disintegration with cavernous formation.

That phthisis may be produced artificially by inoculation, the experiments of Burdon, Sanderson, Wilson, Fox, Cohnheim, Waldenberg, Villemin, and others, fully demonstrate. These experimenters produced phthisis, usually by the introduction or inoculation of matter from diseased glands into the pleural or peritonial cavities; the introduction of setons and a variety of other bodies, harmless in themselves, was followed by the same results. Their observations were made upon animals, especially the guinea pig, but the same results would have ensued if practiced upon the human species, as the following case will prove.

Case.—John H. Jones, æt. 45, color black, died Nov. 11th, 1873. Twelve hours after death the body was brought to the dissecting room of the College of Physicians and Surgeons. The subject was of large size, though greatly emaciated. On examination, a small fistulous orifice was found in the right axillary space; the probe was passed in through the orifice and entered the pleural cavity. As the muscles were removed and the ribs exposed, a most extensive necrosis and caries was revealed, about four (4) inches vertically by two (2) inches horizontally, involving the second, third, fourth, fifth and sixth ribs. The inferior border of the second, and external surface of the third ribs were carious;

while the fourth and fifth ribs exhibited marks of previous violence to such an extent as to destroy a portion of them; the superior border of the sixth rib was also carious. The diseased parts were situated just under the Serratus Magnus muscle, which had been partly detached, by infiltration of pus, at its lower portion. The feature of greatest interest was connected with the fourth and fifth ribs, in which was found an opening, one inch square, communicating directly with the lung substance. From the examination of the bones, it was evident that a fracture of the ribs, attended by much contusion, had previously occurred. The lungs were next subjected to a rigid examination; the pleura, on the right side, was firmly adherent both to lung and chest walls, whilst on the left side the adhesions were slight; no effusion on either side. Both lungs were densely consolidated, and exhibited various stages of degeneration; indurated masses, cheesy deposits, and cavities. On the right side, at the point corresponding to the opening in the bones, a circumscribed pleuritis had evidently existed, and a large cavity communicating with and discharging through the osseous opening was found. The right lung was more diseased than the left. The glandular system showed great enlargement, especially the parotids and mesenteric. Brain not examined.

So remarkable were the lesions, that a careful investigation was instituted to obtain the history of the subject, which, though extremely arduous and difficult, fully repaid the labor. It was found that the man had enjoyed remarkably good health, free from all indications either of pulmonary or syphilitic trouble, up to the last three years since he received an injury by the explosion of a steam boiler. After the injury he lost his health and strength; was frequently sick, with pulmonary trouble; became unable to attend to his regular work, supporting himself by odd jobs, &c. His family history was good.

The injury received was undoubtedly a fracture of the fourth and fifth ribs, and the broken end had pierced the lung substance, causing the circumscribed pleuritis. The cavity communicating with the external orifice was evi-

dently an abscess produced by the fragments of bone, and, from the great inflammation thereby developed, as well as from the pressure, the aforementioned ribs had become carious. The case was certainly one of phthisis pulmonalis; and from the absence of all hereditary taint, from the absence of all suspicion of previous sickness, as well as the character of the lesions found, should be classed as *Traumatic.* The broken bone irritating the lung had developed the abscess, congestion and pneumonitis had resulted, only to be followed by the pathological change common to all consumptive cases, viz: lopular induration, terminating in disintegration and cavernous formation.

Now from this case it can at once be seen, that the law governing the artificial production of phthisis in the animal, applies with equal force to man; for we may consider the broken bone, irritating the lung, as the source of the evil. The same case also furnishes another illustration of Niemeyer's theory, since pneumonic changes had undoubtedly produced the lesions found.

Will not this case account for the large number of consumptives found at our large manufacturing establishments—among iron workers, among stone cutters and coal miners, who work in an atmosphere filled with dust, small pieces of iron, stone and coal? Perhaps it may be argued that but little reliance can be placed on this case, since it was a *subject*, and since tubercles are frequently found in cases who have died from other causes. True! Nothing is more common than to find tubercles associated with other lesions, in the dead house; yet the family history of the case under discussion; the singular immunity from sickness prior to the date of injury; the entire adequacy of the injury found to produce and account for the lesions; the radiating of the tuberculous matter from the point of injury, as a focus, to the whole system; and, finally, the length of time consumed by it, (three years)—are all points of evidence which properly considered, contraindicate a tubercular deposit prior to the injury, or death from causes other than Traumatic Phthisis.—*Physician and Surgeon.*

ARTICLE IV.

Leeches, and How I Manage Them.

BY A COUNTRY CHEMIST.

There are two kinds of leeches recognized by dealers—namely, the green leech (*Sanguisuga officinalis,*) and the speckled or brown leech (*S. medicinalis.*) Our native species belongs to the latter. Sometimes it is difficult to detect any characteristic difference between the green and speckled leeches, and by many eminent naturalists they are supposed to be one species. The former is a native of the south of Europe, and is frequently called the "Hungary Leech," from its being extensively exported from that country. The American pharmacists use a very distinct species (*S. decora.*) Our official leeches may be distinguished by one having a spotted yellow belly, the other is not speckled, but of a greenish yellow.

Leeches are not now so much thought of as in the days of our forefathers. This probably is the reason why we find so little knowledge respecting their habits and employment amongst chemists. If they were more frequently called for by customers, so as to become a profitable branch of the trade, their use and habits would be more studied. The leech, as is well known, is employed only to subtract blood in some local part and in small quantities. The narrowest end or part contains the mouth, the broad and flat end is merely a sucker to hold on to the skin.

The mouth is a triangular aperture furnished with from seventy to ninety teeth, very minute certainly, but called teeth by naturalists. By means of these skin is broken whilst a continual swing-like motion is experienced when the creature is sucking up the blood. It is thought the mouth keeps open the wound whilst sucking, but this is only conjectural; probably it acts upon the same principle as a sponge. The physician when ordering his patient to apply leeches, should mark out the exact spot where they are to

be placed with pen and ink, for sometimes ignorant persons, especially when applying them to the abdomen, allow them to wander about and suck anywhere, but if the place is marked out they would be more careful. The proverbial impossibility of making a horse drink against its will applies equally to leeches. It is at times difficult to persuade them to bite; even when they are induced it is, perhaps, only for a few seconds, and they wander away again. This may arise from several causes. It may be the blood is so impure that directly it is tasted the leech refuses to suck any more; this, however, is seldom the case. If the skin is at all unclean it is useless to apply them. The chemist who sells the leeches should be careful to inform the applicant of this fact; it will save much annoyance. The part should first be well sponged with warm water, then rubbed with a little milk. Sometimes it is well just to gently prick the part with a fine needle, or to rub a small quantity of blood over the skin. I have also seen milk and sugar used with good effect. In cold weather, before applying leeches, they should be placed in warm water about 75° Fahr.—if a tablespoonful of beer is mixed with the water all the better—then for a few minutes allow them to crawl about over a rough cloth or towel; they will afterwards generally bite very freely.

If they are too lively a good plan is to confine them beneath a wineglass until they have fastened on the skin. Many chemists recommend their customers to purchase leech glasses (tubes;) I have found these useful when they are applied in the mouth, but I prefer to work without the tube when applying them to any other part of the body; a wineglass, which is found in almost every house, is all that is required. Persons unused to them do not know the difference between the head and tail, therefore in using the tubes they are apt to apply the tail end to the skin.

I know it is not an uncommon fraud to sell leeches as virgin or new leeches which have been previously used. Dr. Christison's directions for discovering this deception should be known by everybody. He says "the gorging of leeches

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is a more common fraud than the substitution of spurious species. They are known by being less velvety in their coat, less flat when pressed, and presenting a little tumor when squeezed betwixt the fingers from the head to the tail. Leeches which have been used are often sold for unused or virgin leeches. They are best known by putting them on a white cloth and dusting their forepart with finely powdered salt; in thirty seconds a little blood will be emitted, but not a particle if the leech be quite fresh."

It is not a pleasant thought to fancy a leech is being applied to your skin, which has been sucking some patient in a fever ward of a hospital.

Of course no reasonable person can deny that leeches, if healthy, can be used more than once; even Christison states he has used them three days in succession without impairing their activity by immersing them in a solution of sugar and water frequently changed. Directly after removing them from the skin they are commonly sprinkled with fine salt on a plate to cause them to disgorge the blood. To me this appears cruel, not only to watch the leech writhing in agony, but to observe the skin wrinkled where the salt has touched. I just cover them with brown or raw sugar for a few minutes; afterwards it is well to pass them betwixt the finger and thumb holding it by the tail, then place them in water in which a very small quantity of sugar has been dissolved, and change often for the first week. Workingmen and others, to whom the expense of leeches is a consideration, should be instructed as above by the chemist when giving him the leeches; they may possibly be required again by his medical attendant; if so it will save him much expense. A good mode of testing the healthiness of leeches is to hold them for a minute or so in the palm of the hand. The best and healthiest specimens will immediately contract into a roundish ball-like form; these seldom fail to give satisfaction.

Frequently it is desirable to draw more blood after removing the leech. To do so, hot flannels or linen rags

heated and held on the part answer admirably. I have invariably found this the most satisfactory method, far more so than applying hot bran or bread poultices. One thing should not be overlooked, the difficulty in stopping the flow of blood. This seems never to enter the minds of most individuals, yet there are patients met with in every practitioner's experience in whom it is exceedingly difficult to stop bleeding. If a case like this should be suspected when applying the leech, place it if possible and convenient over a bone, where pressure from the finger will often stop the bleeding. If this will not succeed, moistened matico leaves are useful, or linen rags soaked in a strong solution of alum. When the patient is strong and not suffering from any debilitating illness, the loss of a little blood will not be felt, but in the case of a weak child, or a person reduced by disease, it is often important to stay the flow of blood immediately, or they might be so weakened by its loss as to cause fatal results.

Now a word on keeping leeches. I have heard many of my drug friends complain sorely about the loss from this source. To preserve them without loss and in a healthy state we should strive as closely as possible to imitate nature. How can they be expected to live in a fancy glass jar, exposed in a window, beneath the heat of a summer's sun? When I first entered into business, I ordered from a London firm, a hundred speckled Hambro' leeches, which I placed in a large glass globe, but although they were apparently healthy when received, they soon sickened and died. I do not think I sold a single dozen out of the whole lot. I thought this sort of thing would never pay, so I procured a fancy jar, or aquarium, made on purpose, and advertised extensively. It was to be stocked with *Valisneria spiralis* and other water weeds, water snails, sand at the bottom, etc., but I was still far from successful. At last I became so disheartened that I gave up keeping leeches altogether. I had no sooner so resolved, then naturally the demand increased, and in deference to the wishes of a medical

practitioner in the neighborhood, I decided to give the leech trade one more trial. I purchased a large black earthenware jar, with a wide mouth, glazed inside, such as is used by frugal houswives as a pickle jar, only mine will hold nearly two gallons of water. I place at the bottom a layer an inch in thickness, of large pebbles and sand well washed, then I fill the jar about two-thirds with water, hard or spring water does not answer so well as rain water. I change the water on an average every fortnight in the summer in the winter season once a month is sufficient, for then the leeches are torpid; I never allow the water to freeze although it frequently reaches as low as 40° Fahr. The jar is kept in a cool place. I now seldom loose any of my leeches, if the consignment is healthy when received.

I believe the chief cause of failure is exposing them too freely to the light, which excites them. In their native habitat, they live for the greater part of their lives beneath the mud at the bottom of the lakes, where they live in a semi-torpid state; in a dark jar, or where the light is kept from them, they are also semi-torpid.—*Chemist and Druggist.*

EDITORIAL, ETC.

The Thirty-fourth Annual Commencement of the Baltimore College of Dental Surgery was held at Concordia Opera House, on Thursday evening, February 26th, 1874, in the presence of so large an audience that the spacious hall was crowded to such a degree that many were obliged to stand during the entire exercises. The right of the stage was occupied by the Faculty of the College, a number of the members of the Faculties of the different Medical Colleges of the city, and many invited guests, among the latter, alumni of the college from several Southern States. The left of the stage was occupied by the members of the graduating class, while the front along the foot-lights, was covered by a profusion of handsome boquets from the lady friends of the graduates, the number of which kept the members of the boquet committee in active employment for some time. The music was furnished by Prof. Minnick's orchestra.

The exercises commenced with prayer by the Rev. E. R. Eschbach, after which Professor F. J. S. Gorgas, Dean of the Faculty, in announcing the names of the graduates, and the authority by which the degrees were conferred, stated that since the organization of the Baltimore College of Dental Surgery, thirty-five years ago, nearly *eight hundred* graduates have received the degree of Doctor of Dental Surgery, and *twelve hundred* students have attended the lectures of the institution; this College being the first, and for many years the only Dental College in the world.

The Degree of "Doctor of Dental Surgery" was then conferred by Professor Gorgas upon the following graduates, representing eight different States and Europe:

John Abner Chapple, - - - -	Georgia.
Lewis Mileston Cowardin, - - -	Virginia.
Thomas H. Davy, - - - -	Maryland.

Henry Clay Devilbiss, - - - -	Maryland.
Alfred Eubank, - - - - - -	Alabama.
John W. Farmer, M. D., - - - -	Virginia.
Homer Kenyon Green, - - - -	Pennsylvania.
Louise Jacobi, - - - - - -	Germany.
George Vernon Jenkins, - - - -	Maryland.
Douglas Malcolm, - - - - -	Maryland.
Charles Augustus Mercer, - - -	Virginia.
J. Henry Morgan, - - - - -	Virginia.
James Bruce Moseley, - -	South Carolina.
David N. Rust. - - - - - -	Virginia.
Thomas L. Sydnor, - - - - - -	Virginia.
Thomas Ritchie Vermillion, - -	Virginia.
Charles Ferdinand Wagner, M. D., - -	Germany.
William B. Wise, - - - - -	Virginia.
Silas Robert Wyse, - - - - -	Mississipi.

After the degrees were conferred, during which ceremony the services of the Janitor of the College were required to assist in conveying the boquets from the stage, (some of the graduates receiving so many that baskets were required to contain them,) the Valedictory Address was delivered by Professor Henry R. Noel, M. D., of the Faculty. The subject of this Address was "The Mystery of Life," showing its relation and dependence upon the amimal kingdom, and was an interesting and scientific production. As we expect to publish this address in the Journal, our readers will have an opportunity for reading it.

The Class Address was delivered by John W. Farmer, M. D. of Virginia, and was appreciated by his class-mates and the Faculty of the College for its excellence.

The following were the officers of the graduating class of 1874. President, H. Clay Devilbiss, of Md. Vice President, D. Malcolm, of Md. Secretary, J. A. Chapple, of Ga. Treasurer, G. V. Jenkins, of Md. Committee of Arrangements.—G. V. Jenkins, W. B. Wise, C. A. Mercer, S. R, Wyse, T. H. Davy, H. R. Green and Thos. L. Sydnor. The exercises closed with the benediction by the Rev. Dr. Eschbach, and thus ended another of the sessions of the *alma mater* of so many of the dental practitioners of this and foreign countries.

The following changes have occurred in the Faculty of the

Baltimore College of Dental Surgery since the last annual commencement. Prof. M. J. DeRosset having resigned the chair of Chemistry, on account of his removal to Wilmington, N. C., Prof. W. P. Tonry was appointed Lecturer on Chemistry for the session just ended, a position which he filled to the satisfaction of both Faculty and Students. Prof. P. H. Austen having recovered from his recent illness, will fill the chair of Dental Science and Chemistry. Dr. James B. Hodgkin, of Alexandria, Va., was elected Professor of Mechanical Dentistry in October last.

During the coming spring and summer the College Building will be greatly enlarged by the addition of an adjoining building under a new common front, which will add to the size of both Lecture rooms, Infirmary and Dissecting room, and present an appearance not inferior to any institution of the kind in this country.

The *Thirty-fifth* Annual Session will commence on the 15th of October, 1874, and continue until March, 1875.

The Infirmary of the College is open during the entire year.

Character of Amalgams.—Dr. E. A. Bogue, in a paper read before the New York Odontological Society, gives the following information concerning the character of the amalgams in common use:

" The copper amalgam, which is quite difficult to prepare, is dark in color, and its oxide is poisonous. Though extensively used in Germany, it is fortunately seldom or never employed in this country.

The palladium amalgam is quite as black as copper, and cannot be used except in the form of a precipitate; but it is not liable to more than superficial oxidation, and that entirely innoxious.

While most metals combined with mercury are supposed to constitute merely mechanical admixtures or solutions, palladium forms a true chemical union attended by the evolution of heat. This amalgam is very highly esteemed in certain quarters in England; but its costliness, blackness and brittleness, however, prevent its being generally adopted.

The amalgams which have been most in favor in this country, have been, until within a few years past, composed principally of silver and tin.

Among these, however, are some that exhibit traces of other metals; such as Townsend's and Lawrence's, and perhaps a few others, which contain the copper that enters into the composition of the coin silver they use, and Holmes', which contains a small proportion of gold that is added to diminish the shrinkage.

Recently, through the researches of Messrs. Fletcher and Tomes, a new amalgam alloy has been introduced, which is composed of gold, platinum, silver and tin. The office of the silver is to harden; of the gold, to lessen contraction and oxidation; of the platinum, to hasten the setting and preserve the color. All these are essential points, and more essential in England, perhaps, than elsewhere, because an amalgam filling there, as a rule, receives its entire finish at the time of its insertion.

This filling hardens more rapidly than any other which has been in common use; and its contraction is less than that of any other *compound* filling whose contractions have been accurately measured.

As to the shrinkage: It has been thought by some, that the action of certain amalgams in the tooth, drawing together and rising toward the centre, was indicative of expansion. But it may be accounted for by the tendency of some metals to assume the form of a spheroid; and the amalgams which harden most slowly are especially inclined to this shape.

Besides, the experiments which havs been made upon amalgams by the specific gravity test, have exhibited marked shrinkage.

According to a paper read by Mr. Tomes, before the Odontological Society of Great Britain, March 4th, 1872, the variation is from .037 of a unit in the case of palladium to .38 of a unit in the case of tin and silver used in equal parts; the shrinkage amounting to ten times more in the latter case than in the former.

The shrinkage of copper also is very little—scarcely greater than that of palladium.

It has been claimed, however, that the specific gravity test is not sufficiently accurate to measure the shrinkage of these sub-

stances; but a mechanical apparatus, constructed for the purpose of testing the very minute expansion and contraction of bodies, furnishes substantially the same results."

Expansion of the Arch in the Treatment of Irregularity of the Teeth.—Dr. S. A. Guilford, in a paper read before the Pennsylvania State Dental Society, refers to the following methods to accomplish this result:

To produce this expansion of the arch easily, rapidly and with comfort to the patient, it is only necessary to prepare a hard rubber plate closely fitting and covering the hard palate and lingual surfaces of the teeth to be moved, and inserting wooden pegs in holes drilled for the purpose in the plate just opposite the teeth. These pegs placed in the mouth dry and tightly fitting will, when wet, expand and press the teeth; not only that, but you gain the benefit of the elasticity of the rubber plate. The advantages of such an appliance are, that it is very little in the way of the tongue; has nothing hard in its composition to injure the teeth; is easily removed by the patient for cleansing; does not show from the outside, and is thoroughly effective. I have been extremely successful in the use of these plates for the past eight years.

Another means of producing the same result, where the entire superior arch needs widening, and it is desirable to do it quickly, has been proposed by Dr. Kingsley, of New York, and is, I believe, original with him. It consists of placing pieces of elastic rubber between each of the teeth and protecting the gum from the irritating effects of their impingement by placing over the roof of the mouth a thin plate of vulcanized rubber, allowing the points of the plate to extend well between the teeth at their necks. The pieces of rubber are replaced every few days by thicker pieces, until by their action the arch is so enlarged as to permit the superior teeth to overlap and properly articulate with the lower. The articulation of the teeth, aided by a thin rubber plate, accurately fitted to the roof and teeth in their new position, will permanently, it is claimed, retain the advantage gained by the wedges.

This method has the advantage of great saving of time, and

if it be as free from unpleasant results as the author claims for it, it must come into general use.

Mississippi Valley and Missouri State Dental Association.—A joint meeting of these two Associations will be held in St. Louis, Mo., commencing March 3d, 1874, at 10 A. M., and continue until March 8th, and promises to be a very interesting meeting. The Address of Welcome will be delivered by Dr. C. W. Spalding, and the response by Prof. J. Taft. Dr. W. H. Eames, of St. Louis, is President of the Mississippi Valley, and Dr. J. A. Price, of the Missouri Association.

MONTHLY SUMMARY.

Transplantation of Teeth.—In a former number of this JOURNAL, (April, 1871,) we noticed the fact as established, that teeth are capable of being transplanted so as to retain their vitality, forming new attachments, like grafts on trees. Dr. Isidor L. Lyons, an eminent English dental surgeon, furnishes to the *London Lancet* for November, the result of his experience in the operation. He refers to the two attachments that are severed in extracting a tooth—first, the periosteal adhesion, and second, the nervous and vascular connection. There is no reason, he says, why the alveolo-periosteum should not again unite to the tooth, seeing that if a piece of periosteum be stripped off a bone it will re-unite if placed in contact with the bone and kept at rest. The union of the divided ends of a nerve is also a recognized fact; but, even supposing the latter impossible the tooth would merely be in the condition of one which has had its pulp destroyed, a common operation in dental surgery. Out of twelve cases on which he has operated, nine were successful, and three failures. It is difficult, he says, to induce patients to submit to an operation in regard to which they are

so incredulous. The pain pursued by Dr. Lyons, he describes in these words: "A tooth which is to be replanted should be carefully extracted, and as little as possible of the surrounding tissues lacerated; it should then, unless the operation be simply for the destruction of the dental pulp, and when the periosteum is healthy, be immersed in some antiseptic fluid, such as diluted carbolic acid or chloride of zinc, (the latter from experience being preferred;) the socket should then be swabbed out some half dozen times with a strong solution of the same antiseptic employed. The tooth, if carious, should be plugged and returned to its place. If there is any thickening of periosteum, fibrous growth, sac of abscess, or absorption at the extremity of the fang, it should be excised before replantation. Should patient complain of pain arising from the operation, prescribe poppy fomentations, although the pain is rarely more than what is due to the tenderness of parts from the laceration of soft tissues after the extraction of the tooth."

This process is substantially the same as we described in the *Pacific M. and S. Journal* nearly three years ago, and then credited to another English dentist, M. Coleman, who had succeeded in nine out of fourteen cases. Dr. Lyons makes no reference to him, except to mention that he "suggested" the operation.—*Pacific Med. and Surg. Journal*.

Mental Hygiene.—But there is still another class of facts differing from any of those mentioned, that has a powerfull influence upon longevity, viz., the influence of mind upon the body. Mental training, a well-balanced mind, a cheerful, contented disposition, and temperate habits are, with rare exceptions found indispensable. Now these pre-suppose a harmonious development of the whole body, and particularly of all parts of the brain. For it is impossible, we believe, to obtain the qualities here mentioned in a high degree without these two conditions. And the nearer this development approaches that standard of organization upon which is based the great law of longevity, the greater will be not only the aggregate amount of health, but the longer the duration of human life. This statement will be found abundantly verified in the history and character of persons who have reached a great age.—DR. NATHAN ALLEN.—*The Sanitarian for February*.

The New Local Anæsthetic.—The observation of Horwath, of Kiew, that absolute alcohol at a temperature of 20° Fahr. is a most efficient local anæsthetic, deserves to be remembered and acted upon. He finds it far superior to cold ether, or ice, or the spray of volatile substances.—*Med. and Surg. Reporter*.

Microscopic Terrors.—This is the age of detectives in medicine. The best minds are pursuing the physical causes of disease, with the microscope, with chemistry, with imagination. Disease is no longer dynamic but material. Its seeds float in the air, and abound in water, in milk, in food. When one takes a drink of water the chances are that he swallows a myriad of living organisms, vegetabl. and animal, which will carry into his blood the germs of typhoid, of tubercle, of cholera. Milk may be fraught with the poison of typhoid fever, and may scatter the pestilence broadcast. It may conceal the seeds of cholera and plant a great harvest of that scourge. So we are taught. More than that, we are now assured that milk can propagate tubercle. A French scientist has demonstrated that calves fed on substances with which tuberculous matter is mixed, will become tuberculosis, and of course that the milk of tuberculous women will do the same. And then we can not breathe the air with safety, for it may be filled with the germs of palmella, which will enter the blood and grow into an ague-fit. Pork and beef are dangerous from the trichina, and tenia is smuggled into the stomach with vegetables and spring water. We live in a dangerous world, and what with the multiplication and improvements of binoculars the dangers increase every day. It is to be hoped our microscopists will give us a bill of fare, informing us what we may eat and drink, if indeed there is anything salubrious.—*Pacific Med. and Surg. Journal.*

Methylene Ether as an Anæsthetic.—By the introduction of this new anæsthetic, Mr. Lawson Tait feels sure that the days of chloroform as an anæsthetic, for any but obstetric operations, are numbered. The new substance has the following advantages over chloroform: Its action is much more rapid, and is entirely free from the muscular and cerebral excitement often seen in the use of chloroform; the quantity used is less, the sickness after its use is more exceptional, the recovery from the anæsthesia being extremely rapid and complete. Over sulphuric ether it has the advantage that it is very pleasant to take, and that a tenth or twelfth of the quantity is sufficient. He has used it about thirty times, and only in one instance was there any sickness, and in that case the lady had just before the examination, been partaking freely of underdone mutton.

Mr. Tait says he shall use no other anæsthetic for surgical work until he obtains some disastrous result, a misfortune that at present seems more unlikely than by the use of either ordinary ether or chloroform. He adds that its use is more economical than that of either ether or chloroform.—*British Med. Journal.*

The Human Body Compared to a Machine.—In the promotion of health and longevity, too much stress cannot be attached to the importance of preserving this harmony or balance of organization. In some respects, the human body may be compared to a perfect machine, made up of many complicated parts. How different the working or running of such a machine from that of one imperfectly constructed and unequally balanced in all its parts! The one seldom needs repairs, the other frequently. The one will last as it were for an age; the other becomes almost useless in a short time.

It is so in reference to the human system. Whenever a certain organ or class of organs becomes relatively too large or too small, causing a want of balance or harmony in their action, there must be in the very nature of the case far greater liability to disease. Accordingly, it is in persons possessing this imperfect, ill-balanced organization, that we find not only the greatest amount of sickness, but that which is most obstinate and fatal. How often it happens that some slight derangement or trifling weakness operates as the entering wedge to the most serious diseases! It is the weak spot caused by inheritance, or developed by exposure, where disease finds its germ or starting point. through all other parts of the system are in a perfectly sound condition; and not unfrequently life is terminated by a single organ, or even some part of it giving out, when all the other organs might have performed their healthy functions for many years.—DR. NATHAN ALLEN.—*The Sanitarian for February.*

Bad Effects of Thumb-Sucking.—A year or two ago a writer, whose name escapes us just now, showed that the habit of thumb-sucking in children leads indirectly to mental feebleness. Quite recently Dr. Horace Dobell writes to an English exchange:—"I have observed that a peculiar and rather common deformity of the chest is caused by the habit of sucking the thumb in infancy and early childhood. The weight of the arm on the thorax of the child during sleep, produces depression of the ribs in the line occupied by the arm when the thumb is placed in the mouth. As this is a very important effect of 'thumb-sucking,' never hitherto pointed out, I think it desirable to place this note on record, for the benefit of other observers."—*Med. and Surg. Reporter.*

Sugar and Magnesia an Antidote to Arsenic.—The *Mouvement Medical* relates various experiments conducted by Mr. Carl, with the result of showing that sugar mixed with magnesia may serve as an antidote in cases of poisoning by arsenious acid, in which cases, too, the internal use of the hydrated magnesia is most valuable.

Nervous or Sick Headache.—In those forms of sick headache which are preceded by disturbed vision, or other signs recognizable by the patient as preceding an attack, the patient should lie down with the head as low as possible, and if the glimmering be on the right or left of the field of vision, he should lie on the opposite side. He should at the same time take some powerful diffusible stimulant. By this means the defective supply of blood to some portion of brain, which is the real disease, is counteracted. There is always a loss of tone about the cerebro-spinal system in cases of this kind, and of course all measures calculated to improve the general health should be adopted. If the attack is followed or preceded by great mental depression, nothing acts like half a drachm or a drachm of the ammoniated tincture of valerian. A remedy which is often given with great advantage during a severe attack is bromide of potassium in doses of 5, 10, to 30 grains, combined with 30 or 40 minims of salvolatile. If the attacks have been very frequent, or if there be any scrofulous tendency, the iodide of iron may be given in the following form: R Ferri et ammon. cit., gr. v.; potassii iodidi gr. ij.; aquæ ℥j., and, according to circumstances, 15 to 20 minims of tincture of henbane, or 20 or 30 minims of aromatic spirits of ammonia may be added. If the stomach is irritable this may be given in the effervescing form. In other cases citrate of iron with ammonia and strychnine may be given with great success.—*Braithwaite.*

The "Blood Cure."—We have had the "milk cure," and the "water cure," and now we are offered the "blood cure." Invalids in Boston have commenced to patronize the Butchers' Abbatoir, in Brighton, for medical treatment, simply drinking a half tumblerfull of warm blood twice a day. This course, one gentleman, Mr. C. H. Stickney, has followed for ten weeks, and during that time gained ten pounds in weight. Another, a consumptive, so feeble that it was with difficulty he could get to this abbattoir, is now able to handle an axe skillfully enough to "knock down a bullock." A lady sick six years, stricken with paralysis, is improving wonderfully. A gratifying feature of this cure is that it is "without money and without price."—*Med. and Surg. Reporter.*

The Diagnosis of Lipomata.—An excellent suggestion is made in a French journal. A character peculiar to lipomata resides in the property belonging to all fatty tumors, of hardening under the action of cold. When, after the use of ice or the ether spray, in the case of a doubtful tumor, the growth is felt to become harder, the presumption is that the case is one of lipomata.—*Med. and Surg. Reporter.*

Important Point in the Treatment of Frozen Limbs.—It is well known that after a limb has been frozen by exposure, no matter what care is exerted in restoring the circulation *gradually*, there remains a capillary stasis, a blue color, and great danger of violent inflammation and gangrene.

Dr. Bergmann, of Dorpat, recommends and has successfully practiced *vertical suspension of the limbs*, which promptly disperses the venous stasis of the period of reaction with its attendant dangers. If, as is most common, the feet and legs have been frozen, they should be held considerably higher than the trunk, so as to facilitate the reflux of blood to the heart.—*Med. and Surg. Reporter.*

Laws of Health.—With the increased knowledge and observance of the laws of health, many individuals have not only prolonged their own lives, but the average duration of human life, within forty or fifty years, has considerably advanced. But physiology in its practical applications is yet in its infancy. When its principles become so generally understood and appreciated as to be practically applied through-out the community, in every family, and by every individual, then will be found a great diminution of disease, as well as of early mortality.—DR. NATHAN ALLEN.—*The Sanitarian for February.*

Ether Glue.—An excellent liquid glue is made by dissolving glue in nitric ether. The ether will only dissolve a certain amount of glue, consequently the solution cannot be made too thick. The glue thus made is about the consistency of molasses, and is doubly as tenacious as that made with hot water. If a few bits of India-rubber, cut into scraps the size of buck-shot, be added, and the solution be allowed to stand a few days, being stirred frequently, it will be all the better, and will resist the dampness twice as well as glue made with water.—*Druggists Circular.*

Fuschin as an Antiseptic.—This anilin preparation is said by Laujonois, in the *Comptes Rendus*, to be a remarkably powerful antiseptic. One per cent, added to a solution of gelatine, not only preserved it, but a piece of fresh meat wrapped in paper soaked in this medicated gelatine solution kept for months without a sign of putrefaction. One forty thousandth part added to urine, prevents it perfectly from decomposing. Such experiments merits careful repetition.—*Med. and Surg. Reporter.*

Women Dentists in Egypt.—Prof. Edward Warren writes from Cairo, in Egypt, to a friend in Baltimore, that there is "a good opportunity for women dentists in Egypt, as in the East, women are forbidden to consult with men." There are three or four English women practicing dentistry in Cairo already, according to Dr. Warren's letter. In all those Eastern countries there seems to be a wide field of usefulness and profit for women doctors and dentists.—*Med. and Surg. Reporter.*

Chloroform in Dentistry.—At the late meeting of the Society, the following resolution was almost unanimously adopted :—

"*Resolved*, That, in the opinion of the Massachusetts Dental Society, the use of chloroform in dental operations is inadvisable."

Persecution of Male Students.—The *Medicinische Central Zeitung*, Jan. 14, says that 30 young women, chiefly Russians and Poles, have inscribed in the Zurich University. They rudely sieze the best seats, and crowd the poor young men at the clinics; they even smoke to such an extent that the professors complain that it makes them cough. The poor persecuted male students have therefore petitioned the Senate to stop such improprieties. These afflicted youths have our warmest sympathy. —*Exchange.*

Treatment of Burns and Scalds.—Dr. de Breyne highly recommends the following treatment in *L' Union Pharmaceutique;* Hydrate of lime (newly precipitated), forty-five grains; glycerine, five ounces; chloric ether, forty-five drops. It makes up a transparent, colourless liquid, with an agreeable odour, and an alkaline reaction, according to the dose of hydrate of lime. It calms the pain, and prevents or abates inflammation.—*Lancet.*

Lime-water in Stings of Bees and Wasps.—M. Dauverne states (*L' Union Med.*, Oct. 25) as the result of numerous trials, that the pain and suffering caused by these may be immediately assuaged by the application of lime-water—a remedy which may always be prepared at once by the aid of a little quicklime and a glass of water.—*Med. Times and Gaz.*

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ARTICLE I.

Professional Excellence.—Concluded.

An Address of Dr. W. W. H. Thackston, President of the Virginia State Dental Association—delivered at its last Annual Meeting.

Comparatively abundant as are now the resources, and perfect the operations in our specialty, the not distant future holds in reserve more astonishing disclosures and more valuable revelations than have yet repaid the diligence and fidelity of the scientist. It is only a question of time, and labor, and *brain*, when we shall not only know the cause and conditions of dental decay, and how to prevent its occurrence, but we shall have a better, a more homogeneous, and manageable material than gold, or tin, or any of the now known amalgams or pastes, with which we may fill, and build out, and restore to permanent usefulness, such teeth as have been or may be permitted to decay and break down. There is a tradition, which I have been unable to trace to any authentic source, but which was asserted as a fact, in an address by the late distinguished Dr. Townsend, of Philadelphia. "That from the ancient burial places of China skulls had been exhumed, containing teeth filled

with a white, crystaline substance or material, in a state of perfect preservation, unchanged by service in the mouth, or the thousands of years, and all the influences which had fossilized the bones. And my friend, Dr. F. Y. Clark, late President of the Southern Dental Association, informed me that he had seen fillings inserted by a London dentist who had practiced in the East, of similar character, which had for years withstood the secretions of the mouth, and the office of mastication, and that the only clue to the nature of the material, if indeed it *was* a clue, was the quantity of *egg-shells* which for some unexplained purpose this dentist kept himself supplied with—the suggestion of course being, that the particular form of lime composing the shell was an element or ingredient in the composition of his fillings. More recently I have seen in the Journal the report of a similar filling, examined by Dr. W. George Beers, of Montreal, which had been inserted *fifteen years*, the work of a *native Chinese Dentist*, still perfect, and still preserving and supporting the tooth.

The cement Plombe, the Guillois cement, and all the other preparations of oxychloride of zinc and silex, are but approaches to the discovery of this homogeneous and imperishable material which we need for filling and building out to their original forms the decayed and broken teeth that we now treat with so much labor, and so much uncertainty, with the most precious of all the metals. And so likewise in mechanical or artificial dentistry, "Allen's Continuous Gum Work," while yet imperfect, while exhibiting striking defects and objectionable qualities, is a step, a stride, and a long one, towards all that is desirable in artificial dentures. So of the various anæsthetics, those great boons to suffering humanity, which yet dispense immunity from pain, at the peril of life itself. The time is not distant when we shall have an anæsthetic both certain and effective, and absolutely safe and harmless in its action.

Such are some of the incentives which should stimulate, direct, and energize the efforts of the dentist who aspires

to excellence in his profession. As practitioners, as operators, I need not tell you that fidelity to your patients is nothing more, and nothing less, than loyalty to your profession, and devotion to your own interest. Be faithful if need be at the expense of time, and pain, and money, but temper the necessary pain with all the kindness and gentleness which distinguishes a refined and enlightened mind and character. Roughness, indelicacy and rudeness, are qualities least of all befitting the dentist. Abernethy was perhaps not less a great physician, but certainly far less a gentleman and public benefactor, from his boorish manners and indecorous language and deportment. Strive by care and pains-taking, by neatness of person, and cleanliness of instruments, to divest your operations of the dread and disgust with which they are too often regarded. Endeavor to make every operation as perfect as the exercise of all your skill and knowledge will allow, and if possible, make each succeeding operation more perfect than the last.

I am painfully conscious that for the last ten years the circumstances of the South, and of Virginia, especially have been peculiarly unfavorable for the cultivation of excellence in our profession. The war engrossed our thoughts and occupied our time in most instances with unprofessional duties; we were professionally embargoed without and within, and with its close came wide spread and almost universal wreck and ruin. The constrained and enforced neglect of the teeth, yielded a crop of cases affording little opportunity of improvement in practice, and most inadequate compensation for time and labor. A cry and wail went up all over the land for "cheap dentistry," our heart has sickened, and our spirit sunk within us, as we have been daily approached by the cultivated, the refined and appreciative, by the lately wealthy but now beggared—with tears in their eyes, and anguish in their mouths imploring relief; but with the imperative condition that as little as possible must be done, and that little, in the very cheapest manner, and with the cheapest of all available materials. This condition of our

State and southern country has been a great drawback and impediment in the path to professional excellence; but let us continue to work and wait as we have worked and waited in the past; let us continue to work faithfully and under all circumstances do the very best we can; let our motto be "*Patientia et perseverentia vincient Omnia,*" and sooner or later our recompense and reward will be assured.

And now, gentlemen, in concluding this address, let me impress upon you not only as a means, but also as an *evidence* of excellence, the cultivation of cordial fraternal relations with each other; let us cherish the "*Esprit de corps*" which binds together and inspires the members of other liberal professions; let all the amenities of life find full and ample illustration in our social and professional intercourse. Scout, and scorn, and repudiate the distrust and jealousy that would seal our lips, lock our libraries, or close our offices and laboratories upon members of our craft and calling. Happily for the cause of science, and the interests of humanity, the day has passed when professional exclusiveness, or personal arrogance can be accepted as evidence of professional excellence. Let us stand shoulder to shoulder, in our efforts for advancement as men of art, and men of science; let us aid and sustain each other, our educational institutions, our authors and our journalists. Let us tread not only all the avenues of strictly professional knowledge, but leave our footprints in the domain of kindred science. Let us strengthen our powers and refine our characters by systematic study—by historic research, by mathematical and logical analysis, and by the cultivation of *belles lettre tastes* and accomplishments. Such exercises are not incompatible, but conducive to the highest excellence in any profession.

Let us build up and permanently establish this state organization, this Virginia Association of Dental Surgeons, and here upon its altar, let us pledge our devotion to whatever duty it may impose, pledge our resolve to perpetuate its existence, to enlarge the sphere of its usefulness, to increase the attractions of its meetings, and to make it an

honor to the State, as it now is a credit to science and an honor to our specialty. Let us catch and drink fresh inspiration from these annual assemblies of our best men, and let us bear back to our fields of practice and observation the rich fruitage of this yearly harvest. Let us do all this, and step by step, and year after year, we shall find ourselves approaching that degree of excellence which will reward our highest aspirations, and fully compensate our most earnest and indefatigable labors.

ARTICLE II.

Fragmentary Clippings.

BY S. P. CUTLER, M. D., D. D. S., MEMPHIS, TENN.

Dental Cosmos, *July*, 1873.—In Periscope, page 373, writer says: " After using arsenic and creasote, syringe the cavity well with pepsin and shut it in for two days.

I would simply ask for information, (as the writer did not say,) whether he left the arsenicized and pepsinized pulp in the tooth when the final filling is made? I would also ask if it would not be better to remove all of the arsenicized pulp possible before using the pepsin?

Writer speaking of the treatment of pulps on page 276, says: "If nothing but creasote is placed upon the pulp,
I was not aware of that fact; *i. e.*, that creasote would
it will in time run into decomposition."
cause decomposition of living tissue *per se* of any kind. I am seeking information. Further he says: "One of the great dangers of external wounds is in the exposure to the atmosphere; when exposed even for a short time, the germs of infusoria find a lodgment and produce suppuration. I do not say that it is necessary to be exposed to the air to produce suppuration, but exposure certainly hastens it. In putrefaction, animal and vegetable organisms invariably appeared."

A simple wound and putrefaction are somewhat different processes. I know full well that the idea of germs as the cause of suppurating and other morbid processes, is entertained by many writers; yet none of them have demonstrated or proven the fact beyond the simple coincidence of their presence in some instances, and in a very great many other instances to my certain knowledge, there was nothing of the kind, even in cases of fractured jaws, where there was a chronic discharge from the fractured bone direct; none, if such germs or organisms are found, as claimed by many; they undoubtedly are an accidental occurrence, and not a *causus vera* in the case, or a genesis of the morbid processes. In fact, these germs are rather a new or recent hobby not yet rode to death.

On the same page, writer, speaking of transplanting teeth, says: "Teeth have been transplanted, and yet their vitality has been retained." I very well know that the idea is prevalent with the profession, that transplanted teeth do resume their normal vitality; which fact I am not yet convinced of. After there has been perfect or absolute solution of continuity of a part so highly endowed with blood vessels and nerves as a tooth, and then a re-union of those vessels and nerves, perfect restoration of vitality, seems to me to be beyond belief. It has been demonstrated that patches of skin may be ingrafted on to old sores, and there grow and heal, and when a slice is cut from a finger or toe, and placed back and bound on fast, such slice may unite and grow fast, but as a rule, there is a loss of sensibility in such part, so I have been several times told. Now that the peridentium or periosteum may again form a union more or less perfect when a tooth has been transplanted, I am not yet prepared to deny; as in cases of devitalized teeth, the membrane retains a low degree of vitality, oftentimes in a pathological condition in both cases, in others comparatively healthy. This membrane is of low vitality, mostly connective tissue. Now what I wish to come at, is this: Has there ever been a case where a tooth has been completely dislodged from the

socket, then replaced, and afterward a live and healthy pulp within? This is the point I want information upon. You have read of cases where sensibility in the dentine was found or supposed to be present; still, I have never been satisfied with any of these statements. I want to know if any dentist has ever opened the pulp cavity in any such tooth, months after the occurrence, and there found a live vascular pulp? That is the direct point we want more light and knowledge upon.

Missouri Dental Journal, July, 1873, p. 266, a writer on amalgam "thinks the tendency of amalgam fillings is towards spherical attraction, or to assume the globular form, consequently leaving the edges, more especially the angles, thereby causing leakage around the fillings by capillary attraction."

He speaks of burnishing before the filling is hard, so as to close up all places where shrinkage has taken place. This spherical attraction, which is a universal law of fluids when in the form of drops, so small that terrestrial attraction does not prevent, also equally applies to masses of matter in a plastic state throughout the universe, as we see modified in the form of all the bodies of the solar system.

The writer's experience and mine have been somewhat different on the subject of amalgam. He certainly meets with difficulties that I do not meet with as a rule, only in exceptional cases, many resulting from imperfect manipulation and bad material. I confess, I have not observed this spherical tendency to any great extent either in or out of the mouth, where more or less is left in a lump or ball after filling a tooth. That an amalgam filling, where the cavity has been properly prepared, with suitable retaining points, and the amalgam properly introduced, shrinks so as to cause leakage, I am prepared to speak in the negative; even with the old fashioned amalgam made of silver coin filed up and mixed with mercury, and plastered into the cavity with no instrument but the finger, where the cavity could be reached. I have seen such fillings, and know of some that are now

in teeth of 25 years or more standing, even in what were considered bad teeth, and past filling with gold at the time; many dentists in this country can testify to the same fact. With the best amalgams in use, with our improved methods of insertion, I positively know that good and reliable fillings can and are duly inserted throughout this entire country. We often meet with fillings that appear to have started from their beds and be leaking at their sides; in such cases we further discover the filling projecting beyond the margins of the cavity. In such cases when sufficient time has elapsed, on removal of such filling, a dark coating is seen over the surface of the plug. This dark surface on analysis is found to be argentic oxide, insoluble in the fluids of the mouth, hence retained on the surface of the filling. Now where there is a defective filling suffering leakage, this oxide is formed, which occupies more space than the filling before such oxidation, and an expansive force exerted lifting the filling out of its bed, and frequently in such cases the cavity is found to be sound and firm, unless too long a time has elapsed.

Some may deny the above statements, but the proof is what I want. Any burnishing after the amalgam has set before complete hardening, I believe to be injurious to the filling, having a tendency to break up the crystaline process before completed.

Dental Architecture.—In the same journal there is a plan of a dental office and residence given, which is just the thing, and would fill the bill exactly. I wish I had just such a one, and sigh that I *havn't.* Memory naturally reverts back to the time when I first commenced the practice of dentistry; when instead of our patients coming to us as they now do, we went to them, and *for them*, and if entirely convenient for our patient to have the work done, we proceeded to business; if not, she would send us in word that it was not convenient to have her teeth operated upon that morning, and excuse her and call again.

When we commenced business, a window was solicited, a small table, a couple of split-bottom chairs placed in posi-

tion, the case of instruments unrolled and spread out on the little table, a towel and a tumbler of water completed the arrangements. Now to business: Our patient was seated in the chair next the window, ourself stationed on the right, our left foot placed in chair *number two* behind our patient, the towel spread gracefully over our knee, and our patient's head laid gently thereon, face heavenward, mouth ajar, and we were in for it, our back observing the shape of a hoop. At that time we had never seen a dental chair, only a picture of one in Snell's old work on Dentistry. We did not pick up facts then with the same facility that we do in dental matters now, each dentist as a rule, kept what little he knew to himself, and very little it was too. Once in a while some less cautious than others would let drop an idea which was at once gobbled up like a duck would gobble up a June bug.

Dental Register, July, 1873, p. 298, writer speaking of the immunity of animal's teeth from decay, says: "It is stated that the South Sea Islanders have remarkably fine teeth, which they file off occasionally; the latter needs confirmation. At all events it is evident that rapid decay takes place on a surface protected from wear by a deposit of 'tartar,' or by the constant presence of other foreign material. There is much yet to learn of enamel."

Now that teeth decay under "tartar," or where protected by "tartar," I have yet to learn. All dentists recognize the fact that tartar protects teeth from decay wherever deposited; even when it accumulates in a carious portion of a tooth it effectually arrests further decay, and that without any cleaning out, as in dental operations. Where there are great accumulations of tartar, "caries does not progress as rapidly as in the opposite extreme, or where there is no tendency to accumulations of tartar.

Cosmos, August, 1873.—Under the head of "Dental Operations During Pregnancy," writer on page 407 says: "We throw out the very principles necessary to make bone from our staple bread. The blood not containing this element

in sufficient quantity, a demand is made upon the parent's system with the consequence we have already mentioned as affecting teeth. Now the exposed pulp when capped, fails to throw out what it has not at command, and cannot shield itself by a deposit of secondary dentine. Thus it is asserted by surgeons of extensive experience, that fractures unite with much more difficulty during pregnancy; that non-uniting fractures are more numerous, and all efforts at irritation will prove fruitless until after delivery."

Now all the above facts as stated, may be met with in fashionable life, where little physical exercise is taken, more or less decidedly pronounced, depending on many causes too numerous to mention. That the condition of teeth and bones as set forth by the writer, pertains to any great extent in the rural districts, where females perform physical labor as a concomitant of their habits, the facts are wanting to establish, supposing the bread and other foods being just about the same, as there is not much difference now-a-days in bread.

The luxurious female, whether pregnant or not, is more subject to caries and tardy bone healing than the stout robust labor-worn female. The one is all nerves and bad digestion, the other all muscles and good digestion; the one subject to acidity of stomach and dental decay, the other not; the one physics off an over meal, the other works it off and does not suffer from it.

That the blood lacks in lime salts as the writer says during pregnancy, may be so or not, as our data are not sufficient to fully prove the fact, and if the fact be proven beyond doubt, this fact may, and no doubt is dependent on imperfect digestion or assimilation of food, and the amount of lime necessary that may have been taken in with the food, even refined bread carried out again as *debris* unassimilated.

There is in almost all cases lime enough for the small amount needed for fœtal development during a period of nine months, which would not even necessitate any additional amount of food during this term to furnish the needed supply.

That refined flour is out of place for all young people and pregnant woman, I will admit, but for the aged, who is being fossilized by lime in excess in the system, I think fine flour lengthens the chances of longevity, other things equal.

June No., 1873, *Missouri Dental Journal*, p. 212.—Writer treating of vital action in connection with dental caries, says: "In the teeth themselves, exostosis is caused by the irritation of a *dead* and *decomposing pulp*, and at other times absorption of the cementum and dentine of the roots takes place from the same cause."

The writer here regards both processes as *past vital*, though the one is a wasting, and the other a building one, or that of deposition. The writer may be correct in both statements, though to my idea in only one, that of disintegration wasting called absorption. The building process, or exostosis, so far as my own researches go, have led me to think otherwise, from the fact that we have no proof of any such action taking place after the death of the pulp is complete, but may be carried on up to that period, and is chiefly caused by irritation and weakening of vital resistance in the interior and exterior of the fang. After internal death then all building processes necessarily ceases, which by careful observation in a sufficient number of cases will I think satisfy any one who has made this process a special study.

American Dental Association, 1873.—One speaker says: "With reference to the action of acids and alkalies upon the teeth in the mouth, I am still of the opinion that the alkalies are the most destructive; they act upon the *pabulum* taking away the base.

The presence of acids does not prove that they are the cause of decay. There is nothing so destructive of animal life as the alkalies."

Can the speaker show a case of caries where there never has been acidity of the mouth; or where there has been uniformly an alkaline condition? I doubt it.

Another speaker says: "Alkalies may destroy the teeth by overcoming vital force, and by causing the elimination

of an acid destructive. Alkalies will not destroy a tooth if immersed in them."

In this case the speaker did not explain how alkalies overcome vital force, hence we are still in the woods in relation to how the thing is done. Neither can we understand how the presence of an alkali can eliminate an acid in or out of the body.

Another explaining how alkalies destroy the teeth, says: "These alkalies enter the blood vessels, then coming directly in contact with the tooth substance, through the local circulation, destroy the *pabulum* of which the tooth is formed."

This explains the whole thing, though I must confess I do not exactly understand it yet, there seems to be some obscurity still unexplained, at least n my mind. The subject was ably discussed by other speakers.

Another speaker remarks, "I think the truth will be found between the two theories. Alkalies enter the tooth at the *distal* end of the tubuli and interglobular spaces, and act upon the tissues. Its affinities for the *pabulum* causes it to attack the teeth in passing the interglobular spaces, being attracted by the pond of supply."

This last speaker has got us still further into the wilderness. I do not exactly understand where the distal ends of tubuli are, and from his remarks he seems to entertain the idea that interglobular spaces are always to be found in all teeth, especially when they decay; this is something *new* again. So far I am only able to discover theory instead of demonstrable facts and proofs, which I imagine cannot be given in the premises.

Another speaker having noticed the evil effects of alkalies on the teeth, says: "In the constant use of baking powders and soda, the phosphates are eliminated and the *pabulum* destroyed."

I cannot see the proof in any of the above statements. I do not understand how baking powders can render the secretions acid, so as to take away the phosphates, after such

powders have removed the *pabulum*. Other arguments were used but not exactly explanatory and satisfactory. It is rather singular that none of our late society meetings have taken up and discussed *Bumgardner's* new method of pulling teeth. it certainly is the latest novelty in our specialty.

Care of the Teeth.—By the Tennessee Dental Association, Nashville, 1873. Under the heading of "Caries of Teeth," I notice the chemical constitnents of the teeth as given by Berselius, in 100 parts, viz:

Phosphate of Lime,	85.3
Fluate of Lime,	3.2
Carbonate of Lime,	8.
Phosphate of Magnesia,	1.5
Soda and Muriate of Soda,	1.
Animal matter and water,	1.
Total,	100

Says: "Any one at all familiar with the principles of chemistry, would at once conclude that the above named salts, unless protected by a large amount of animal matter, would be readily acted upon by acids of every kind. Then, too, the low degree of vitality existing in the teeth greatly favors this combination. Acids will not act upon living healthy bone, because the vital force holds in obeyance the force of chemical affinity; but upon dead bone they act with such rapidity that they have taken the place of saw and chisel in many cases where the removal of carious bone is required. In the teeth, however, the vitality is so low that repair never takes place when injury is done to their structure, and they seem to be given up to mechanical and chemical influences."

I give the analysis copied from "Peasley's Human Histology of the Teeth."

DENTINE SOLID SUBSTANCE.

Phosphate of Lime,	64.$\frac{1}{3}$
Carbonate of Lime,	5.$\frac{1}{3}$
Phosphate of Magnesia, Soda and Salt,	2.$\frac{1}{3}$
Organic Substance, (Osteine,)	28.
Total,	100.00

ENAMEL.

Organic Matter,	3.59
Inorganic Matter,	96.41
Total,	100 00

CEMENTUM.

Organic Matter, (Osteine,)	32.24
Earthy Matter,	67.76
Total,	100.00

Phosphate of Lime and Fluoride of Calcium,	58.73
Carbonate of Lime,	7.22
Phosphate of Magnesia,	.99
Salts,	.82
Cartilage, (Osteine,)	31.31
Fat,	.93
Total,	100.00

ENAMEL.

Phosphate of Lime, some Fluoride of Calcium,	89.82
Carbonate of Lime,	4.37
Phosphate Magnesia,	1.34
Salts,	.88
Cartilage,	3.39
Fat,	.20
Total,	100.00

Analysis of bones are about the same as that of cementum, 33 organic, and 67 mineral. The analysis in this little pamphlet was by Berzelius, who flourished fifty years ago, and could refer to the enamel alone, and not to the teeth in whole. This committee should have been more particular in giving the chemical equivalents of the teeth in a popular treatise of the kind, as there are learned men in Nashville as well as in other places, that would readily detect the error. This analysis shows only one per cent. in the 100 of animal or organic matter proper, which would teach the community that the teeth were truly dead organs in their mouths, and not live things at all.

The ideas advanced in relation to vital resistance in living bones, and the ready disintegration of dead bones, are in both instances overdrawn; as dead and detached pieces of bone may and do often remain a long time in many instances without any great amount of disintegration. Many such instances have come under my own observation. As to true vital resistance in bones being so much greater than in teeth, it lacks data to sustain the statement. The teeth in fact are highly endowed with nerves, and from their naked and exposed condition have truly wonderful vital resisting powers, so far superior to any other bones. Bones are covered up and protected from all outside enemies, but of very low vital endowment *per se.*

ARTICLE III.

Class Address.

Delivered at the *Thirty-fourth* Annual Commencement of the Baltimore College of Dental Surgery.

BY JOHN. W FARMER, M. D., OF VIRGINIA.

Ladies and Gentlemen:—We are here to celebrate the *thirty-fourth* annual commencement of the Baltimore College of Dental Surgery; and on the part of the graduating class, I am before you not only to extend to you a cordial welcome to this hall, but also the most heart-felt thanks of every member of the school for the kindly interest you have manifested in us by your presence here to night. It is indeed gratifying to us, that at the closing hour of our collegiate course we should be greeted with the smiles and floral demonstrations of so many kind friends and fair ladies of this most renowned city.

Our stay of a few short months among you has been sufficient to bind you to us with cords of friendship that can never be broken. We can take leave of you to-night with sincere reluctance, and shall carry to our homes the most grateful remembrance of your cordial hospitality and gen-

uine friendship. Permit us in parting to assure you that we appreciate the high social advantages you have so cheerfully accorded us, and shall ever cherish for you the fondest recollections, and the most pleasant memories.

Gentlemen of the Faculty:—It is painful to realize that this is the last time we shall meet you as a class. The earnestness and zeal with which you have taught us, the patient self-denying sacrifices which you have ever been ready to make for us, and the anxious care and counsel you have bestowed, deeply impress us with your skill and ability as instructors, and induce us to believe that your kindly interest and solicitude will follow us beyond the precincts of our college life. We need not assure you that in all coming time we shall cherish for each and every one of you the most abiding friendship and affectionate regard.

Willingly would we linger to listen to your words of wisdom, and draw lessons of instruction from your patient and careful teaching. In this moment of painful parting, accept if you please, our most sincere and heartfelt thanks, both for the very many acts of kindness and courtesy which we have ever met at your hands, and for the able and efficient manner in which you have guided us in the arduous tasks we have had to perform.

Gentlemen of the Graduating Class.—It becomes my pleasant duty before we part to say a few words about the duties and responsibilities which await us, as members of the profession into whose ranks we are this night admitted.

Recognizing the imperative necessity of a thorough course of mental discipline to entitle its graduates to the just claim of members of a liberal profession, to the dignity of which our specialty has now risen, this College has embraced in its course besides the purely dental branches, as full instruction in several collateral sciences as is taught in the universities and best medical colleges in this country.

But neither professional nor literary institutions claim to send out their graduates as men of great learning and ripe scholarship at the time they confer their degrees. The

great purpose of the long course of training to which they are subjected, is not so much mere acquisition of actual knowledge, as to teach them how to think for themselves; to unfold their capacities and powers of mind; to give them broad expanded views; to build up within them a *force* of thought which may be turned at will on any subject upon which they may be called to pass their judgment; to impart to them a concentration of attention, an accuracy of observation which will enable them to reduce complex subjects to their elements, and dive beneath effects to causes, and rise from particular facts to general truths.

The young graduate of medicine, after he has enjoyed all the best advantages of the lecture and the clinic, upon assuming the practice of his profession, finds that he is in possession of not much more than the theoretical part of it. No amount whatever of mere theory can put him at once at his ease at the sick bedside, and give him confidence, efficiency and success there.

The teachings of our specialty, I am aware has not been wholly theoretical; but we have been instructed as far as possible in the practical manipulating details of it, and still we must all feel that we are standing simply upon the threshold of a great work before us, with only the foundation laid, while the superstructure is yet to be erected. Let us strive to build substantially upon this foundation, and see to it that the fabric we rear shall in quality of material, in artistic execution, in symmetry of shape, and in style of architecture, correspond strictly with the plans and specifications that have been given to us.

Dentistry has but too recently been assigned to the elevated position which it now occupies, as a truly scientific pursuit to have engaged the large number of learned men, which has accumulated in the older professions. But from the first there have stood out among those who have been engaged in it, men who would have been ornaments in any position of life in which they might have been placed; men who labored under the greatest difficulties to develope

it into a profession. The idea for a long time prevailed that it was a purely mechanical pursuit, and for the most part men without a great amount of culture, simply mechanics, were attracted to it. And not until more recently, has the fact been fully recognized that there is the same necessity for a thorough medical course to gratify the dental practitioner for the successful prosecution of his work, as should be possessed by the general surgeon; and, furthermore, that it calls for the cultivation of æsthetics to a large extent; that to be a good dentist, one should not only be a mechanic, but an artist in many respects of the highest type.

What we want in the profession now, and what we are happy to believe are being added yearly to it, are men of a high order of education and qualification; men who are prepared to illustrate more fully the utility of our calling, by bringing to their aid the most liberal studies and largest improvements attainable by cultivating scientific pursuits, enlarging their views and reaching out in every direction for knowledge, which they can lay under contribution to it. Such a course of cultivation must necessarily contribute largely in many ways to the advancement of our science and art, by affording the needed aids and appliances in carrying forward the many improvements which are yet to be made in our specialty. The last few years have witnessed a progress in both the scientific and artistic departments wholly unprecedented, and I hazard nothing in predicting that during the next few years the developments will keep pace with the recent advancements. Why may we not aspire to assist in carrying them forward?

Fellow Classmates:—It now only remains for me to add a single word of parting, and the duty which you have so kindly assigned me is performed.

We met here at the commencement of our college course as strangers; together we have toiled through the college curriculum, and are now about to pronounce to each other the saddest of all our words, farewell. Memory loves to dwell on college days, and for each other I am sure we will

cherish through all our coming lives the fondest recollections of our associations here. Together we have toiled long and patiently for the reward which we have this evening gained. We have received our diplomas, and enter now upon those higher walks of professional life, for whose steep ascents our careful disciplining, I trust, has somewhat prepared us. What incentives there are to stimulate us to noble exertions in the prosecution of the profession of our choice!

We carry with us the credit of our science and art, the reputation of our teachers and the name of our *alma mater*. As the custodians of these sacred truths, and with a firm resolve to do our whole duty at all times, in all places, and to all men, let us go forward with an abiding faith, that our success will be commensurate with the high obligations that are upon us.

And now ladies and gentlemen, professors and classmates, farewell.

SELECTED ARTICLES.

ARTICLE IV.

Tobacco.

Read before the Detroit Academy of Medicine.

BY J. W. MASON, M. D., DETROIT.

Tobacco was discovered by Columbus and his crew, at Cuba, in 1492, and was introduced by him into the old world, and the " lightning speed with which its use spread over the earth is one of the greatest miracles in the history of commerce, and the coincident appetite of the human family." And, notwithstanding the powerful opposition

that it has received from reformers, and even royal edicts, it has maintained itself against their wrath, and, to-day, the fascinating fumes of the weed hold in abject slavery millions of human beings.

In the composition of tobacco the most essential element, or principle, is nicotine. It is a colorless, liquid alkaloid, and has a burning, acid taste. It is one of the most intense of all poisons, approaching in its activity to hydrocyanic acid. The next most important element is a concrete volatile oil, called nicotianin, which is also an intense, active poison, differing, however, essentially from the alkaloid, and is supposed to act differently on the vital organs.

It is said that chewers get less of the oil but more of the alkaloid, while the smoker gets more of the oil, and therefore claims that as he does not get the deadly alkaloid, the practice of smoking is less detrimental than that of chewing. But Prof. Morries has shown, in a series of analytical examinations, that tobacco smoke does contain nicotine, and that, if it were allowed to accumulate in the blood, the act of smoking would soon be fatal. Headland says: "It is certainly absorbed to some extent, but it passes quickly into the urine, where it may be detected by a simple chemical test." We are aware, however, that the introduction of but a very small quantity in the system will produce marked indications of intoxication in those who are not accustomed to its use. And that it is only after a morbid condition of the system has been produced, that fragrant fumes can be inhaled with any degree of safety or satisfaction.

In habitual smokers—those who have become "iron clad"—it often excites thirst and an increased flow of saliva; but being an exhilarant, it soon produces, says Pereira, "a remarkable soothing and tranquilizing effect on the mind, which has made it so much admired and adopted by all classes of society, and by all nations, civilized and barbarous." But this tranquilizing effect, says Headland, is nothing more or less than "inebriation or drunkenness, which may exist in various degrees."

There is no need of much physiological acuteness to account for the bad effects that this pernicious habit has on the health of the constant consumer, when we take into consideration that tobacco is a powerful narcotic poison, which when brought in contact with an absorbing surface like the mucous membrane, cannot fail to arrest or retard all the more minute molecular changes which are constantly taking place in the healthy state of the living tissue.

I am unable to determine to what extent the practice of chewing conduces to the production of disease, but there is any amount of medical evidence showing the baneful effects of smoking. Dr. Prout says that it "disorders the assimilating functions in general, and particularly the assimilation of the saccharine principle." Monsieur Fiévée, an eminent French physiologist, claims that the use of tobacco smoke develops numerous constitutional diseases, among which he enumerates dyspepsia, congestion of the brain, apoplexia, palsy, mania-a-potu, insanity, nervousness, amaurosis, and emasculation. He also adds, there exists "a danger of far greater interest to those concerned in the preservation of the individual, in the enfeeblement of the human mind, the loss of the powers of intelligence and of moral energy: in a word, of the vigor of the intellect, one of the elements of which is memory."

An eminent London physician says that "smoking tobacco weakens the nervous powers, favors a dreamy, imaginative, and imbecile state of existence, and sinks its votary into a state of careless or maudlin inactivity, and selfish enjoyment of his voice." Prof. Laycock corroborates these observations, and says that the "inveterate habit of smoking is worthy the special notice of physicians, as a very frequent but unconsidered and unthought of cause of disease."

In my own professional experience, I can recall to mind many cases where the pathological conditions were undoubtedly induced by excessive smoking; and I could present hundreds of cases, reported by eminent physicians, where disease, and even death, has been produced by the use of tobacco.

Trousseau and Bretonneau, both eminent French physicians, have reported many fatal cases, which they attribute to the use of tobacco. Berat, the French poet, was one of the cases.

The late Dr. Zina Pitaher, in 1855, reported a case of delirium tremens occasioned by the excessive use of tobacco. Dr. Bucknill, in 1843, reported eight cases of insanity received into the Massachusetts State Hospital, produced by the use of tobacco. Dr. Kirkbride, of the Pennsylvania Hospital for the Insane, also reported four cases of insanity in 1849, caused by the use of tobacco. The use of tobacco, he says, "has, in many individuals, a most striking effect on the nervous system, and its general use in the community is productive of more serious effects than is commonly supposed."

Results of this kind are quite in keeping with what we know of the physiological properties of the oil and alkaloid of tobacco. It is reasonable to expect that the practice of volatilizing tobacco, so powerful a sedative poison, and applying its vapor to the lining membrane of the air passages, would produce derangement of the nervous system, varying in intensity according to the great or less dilution with atmospheric air.

King James, in his celebrated counterblast against the use of tobacco, says "that smoking is a custom loathsome to the eyes, baneful to the nose, harmful to the brain, dangerous to the lungs, and in the black, reeking fumes thereof, nearest resembling the horrible Stygian smoke of the pit that is bottomless."

Having brought forward evidence enough to convince the most skeptical that the use of tobacco is not only a foolish, but a most deleterious habit, I will only present one individual case of the somatic effects of tobacco for your consideration.

Mr. G., a young man of twenty-six, who was an inveterate smoker, and in whose constitution the nervous and lymphatic temperament are singularly blended, came under my

observation June 23, 1873. Without any promonitory indications, he was suddenly attacked with spasms, attended with severe cramps of the extremities, nausea and vomiting. The spasms lasted from five to ten minutes, during which time he was apparently unconscious. As soon as the paroxysm passed off he would regain his consciousness but there was a remarkable depression of spirits, with great prostration of muscular strength. The remission lasted from fifteen to twenty minutes.

After several seizures, the pulse became weak and frequent, the skin cool and bedewed with sweat; the countenance was pallid, and eyes sunken in the sockets. The feet and legs became ice cold, and at one time I had grave apprehensions for the safety of my patient, but, after nearly two hours of active application of dry heat, and gentle friction to the extremities, aided by a hypodermic injection of morphia, and a large sinapism over the stomach and bowels, with the administration of small doses of brandy, tinct. ginger, and aqua menth. pip., I had the satisfaction of seeing a radical improvement in my patient.

After he was relieved of the malady, the skin soon regained its natural temperature, the haggard expression of countenance passed away, and he rallied rapidly from the nervous and physical prostration.

In the morning, after a refreshing night's sleep, he arose feeling nearly as well as ever. He partook of a moderate breakfast, and then resumed his pipe; but, unfortunately for him, the fragrant fumes did not produce the tranquilizing and soothing effect spoken of by Pereira, but produced a recurrence of the malady that he had suffered so fearfully with the day before.

Believing that smoking was the proximate cause of his difficulty, I strictly enjoined on him abstinence from the further use of it until, at least, he had regained his wonted vigor. But about four P. M., he was again tempted by the overwhelming power that the fascinating fumes of the weed had over him, to resort to its use again. The result was the

same as before, only more severe. He remained for a long time unconscious, after the spasms passed off. The coldness and muscular prostration was even greater than in the first instance, and it was with great difficulty that reaction was effected.

After reaction took place he convalesced rapidly, and, having forsworn his pipe, was not troubled by any further recurrence of the malady.—*Detroit Review of Medicine and Pharmacy.*

ARTICLE V.

The Recent Death in a Dentist's Chair.

J. F. Babcock, D. D. S., writes to the *Boston Medical and Surgical Journal*, as follows:

"It is evident to me that exceptions of the strongest nature may be taken to the wisdom and accuracy of the verdict recently returned by the jury, in the case of the late Mrs. Crie, who died while inhaling a mixture of ether and chloroform in the dental chair of Dr. Eastham, in Boston. The jury came to the conclusion that 'her death was caused by the inhalation of chloroform,' and took the opportunity to 'caution the public against the inhalation of so dangerous an agent as chloroform for the production of insensibility to pain.'

I have watched this case with exceeding care, and, if testimony of the witnesses may be relied upon, I fail to perceive the slightest foundation for such a verdict, or any reason, growing out of the investigation of this affair, which should warrant the sweeping condemnation of chloroform implied by the 'caution.' My exceptions to the verdict take form, when I assert my belief that there were three other distinct, and exceedingly probable, causes of death in this case, independent of *direct* death from the action of chloroform.

First, we have the testimony of Mrs. Sawyer, who was present during the operation, and who assisted in the en-

deavors to resuscitate the unfortunate lady, that she 'never saw a woman so tightly laced in her life.' Please remember that a *woman* says this, and then imagine what must have been the effect upon Mrs. Crie's organs of respiration. She could not inhale the usual quantity of atmospheric air so very important to be freely mixed with the chloroform, nor could she exhale the normal quantity of carbonic acid gas so vitally requisite under such circumstances, while such *intense* compression would tend to crowd the lungs upon the heart, and impede, or perhaps, *wholly arrest its action*, especially were it a weak one. There are cases upon record where jurors have found, under exactly the same conditions, where chloroform, or any other anæsthetic, has been exhibited, and where death followed, that the result was due to the compression of the respiratory organs induced by tight lacing. I ask, is it not fair to suppose that Mrs. Crie's death *might* have been due to tight lacing and consequent undue compression of the lungs and heart?

Secondly, it is the testimony of several witnesses that Mrs. Crie was of what might be termed a hyper-nervous temperament. Her excessive fear that she might possibly feel pain from the operation, as she did upon a previous occasion, compelled her to refuse the administration of nitrous oxide, or laughing gas, and induced her to beg Dr. Eastham to be '*sure* and give her enough.' This request she repeated several times, while he assured her that he would do so. All this goes to demonstrate the excessive fear with which she regarded the operation, and which, in my opinion, should have contraindicated the exhibition of chloroform, unless such excessive fear could have been previously allayed. No person, save those who have witnessed it, can realize the effect of such extreme fear in women of a highly nervous and sensitive temperament. It is in the testimony that Dr. Eastham proceeded with the administration of the anæsthetic, and while she was evidently in a conscious condition, *said* to her, 'I am going to extract this tooth now,' to which she expressed decided disapproval, but he proceeded to carry

his intention into execution, and did so, when she screamed with fear and pain, and immediately went into a spasm, from which she never recovered.

Up to the time of the extraction of the tooth, it is not mentioned that there were any contra-indications developed which forbade further administration of the anæsthetic; but instantly after the operation, she sank rapidly. As is well known, fear has a most depressing influence on the heart's action, and this should be carefully taken into consideration when administering chloroform. How many persons faint, even while preliminary arrangements, in anticipation of an operation, are going forward, and, indeed, how many are the cases upon record, of death from such fright. It would seem, then, but a reasonable supposition that Mrs. Crie's death might have been due to the depression of the heart's action, induced by excessive fright, combined with its inability to recover from such depression in consequence of the pressure of the lungs upon it, induced by the tight lacing.

Thirdly, it is in the evidence that the post mortem revealed the fact that the muscular walls of the heart were abnormal in their lack of tone, that they were weak, unusually so. Now, while the condition of this heart alone was sufficient, were it known beforehand, to constitute a contra-indication, yet, when you take into conjunction with it, the natural effect of fear, and the compression of the lungs upon it, is it at all strange that Mrs. Crie should have met with her death as she did? In fact, would it not have been most remarkable if she had lived? It seems to me that it would have been almost a miracle. In view of these facts, why make such a sweeping condemnation of chloroform? I would not be understood as being an advocate of its use, whenever it can be dispensed with, for it possesses a property, in that it is a local anæsthetic—which ether is not—which makes it more or less dangerous, especially so in abnormal conditions of the heart. Dip the finger in chloroform and it will become sufficiently insensible to pain

to perform operations upon it. In all probability, fatal results arise from this very ability to produce local anæsthesia. The blood goes from the lungs directly to the left auricle of the heart, thence to the left ventricle to be propelled through the aorta. The cardiac arteries going to, and supplying, the heart's structure, charged with chloroform vapor, which may cause local anæsthesia of the heart, and hence cessation of its action, or syncope; the heart's muscular fibres are relaxed and deadened, and thus it follows the chloroform is, so far as the heart is concerned, a specific narcotic, and hence its danger. But in some operations, especially in the oral cavity, where the first step may be of a character starting, in some sustances, frightful hæmorrhage, which can be combatted only at the completion of operation; to have a patient pass from control at such a moment, and under such circumstances (as they are most assuredly liable to do with ether alone), is sometimes a matter of serious concern; and, under such conditions, I maintain that chloroform is indispensable, and those gentlemen who composed that jury—if it be that they were any of them practitioners of surgery—known it just as well as I do, and, therefore, I ask again why such an *unqualified* condemnation of chloroform? Had they restricted their disapproval to its inhalation for the performance of so simple an operation as the extraction of a tooth, I should have agreed with them heartily. But they did not; they caution the public "against the inhalation of so dangerous an agent as chloroform for the production of insensibility to pain," regardless of the character of the operation to be performed. Such a condemnation is unjust in every sense of the word, since it condemns in advance every surgeon who deems it his duty to administer it, and doubly so when its foundation suggested by the results in Mrs. Crie's case (where the only reason they had, as it would seem, was the fact that she inhaled it), as it has been the aim of this article to demonstrate.

[We readily publish this letter as a proof of our willingness

to hear both sides of the question; but we cannot attach any importance to the objections of our correspondent, with the exception, perhaps, of the first. We do not know on what authority he states that Mrs. Sawyer testified that she "never saw a woman so tightly laced in her life;" according to our special reporter, she said only that the deceased was laced very tightly. With regard to the intense fear, it is entirely an assumption: there is no evidence to show it. The fact that the patient asked thrice to have enough of the anæsthetic shows confidence rather than anxiety. The statement that chloroform is indispensable in severe operations in the mouth, and we may add, under any circumstances in cival practice, is contrary to all experience in cities where ether is understood and come only from a want of familiarity with the latter anæsthetic.—Eds.]

ARTICLE VI.

Pepsin.

BY R. T. EDES, M. D.

Read before the Dorchester Medical Club.

Pepsin is the peculiar ferment present in the gastric juice. As a physiological experiment, the juice itself can be used for artifical digestion, but obviously cannot be obtained in sufficient quantity for therapeutic application. Various methods have been employed to obtain the active principle in a form suitable for medical use. Boudault's, Morson's, Beal's and various others have been prepared in Europe, but it is sufficient to mention only the three first, as the others have not come into use here. "The pepsin of commerce is either mucus of the stomach scraped off and dried, or a mixture of pepsin, peptones and starch, containing a little lactic acid."* Beale's corresponds to the first part of the description. Boudault's and Morson's to the second.

* Gmelin's Handbook of Chemistry. 1870.

By far the larger part of these consists of starch, as a diluent is necessary to enable them to be dispensed.

The process of Mr. Scheffer, of Louisville, consists in macerating the chopped mucus membrane of the hog's stomach in acidulated water, and, after allowing the mucus to settle, precipitating the pepsin by a saturated solution of common salt.

The precipitate is dried upon a cloth, its digestive strength estimated by experiment, and then mixed with sugar of milk in such proportion that 10 grains dissolves 120 grains of hard-boiled white of egg in four to six hours under the appropriate conditions.

Although this experiment cannot be considered as exactly representing the amount of work done in the stomach, yet it furnishes the only available means of comparison between different preparations. I have examined, in this way, Boudault's neutral, Morson's, Procter's, Hawley's, and the "Aromatic Liquid Pepsin," which has been extensively advertised within a few weeks. Procter's and Hawley's, the first of which is avowedly, and the second probably, made by Scheffer's process, were exceedingly efficient, leaving but a small residue, and that pulpy and friable. The action of Morson's and of Boudault's was very slight, in fact hardly perceptible, and the same is true of the "Aromatic Liquid Pepsin."† These experiments were performed only twice with Boudault's and Morson's, with the same result, since there seems to be no reason for using imported preparations, which are more expensive, less elegant, and vastly less efficient than those which we have furnished us here. As regards the "Aromatic Liquids," the experiment was repeated twice more with a similar result.

I did not succeed in making Procter's, which was the preparation used in subsequent experiments, dissolve the full amount of albumen, but it may easily be imagined that

† Since writing this sentence, I have noticed in the Practitioner an examination of three English preparations, Savory & Moore's, Morson's pepsina porci, and Squire's. The digestive power of all was extremely slight.

the variation in the amount of heat, in the degree of comminution, and especially in the amount of stirring and of shaking, might have a great influence on the quantitative result. In each experiment, however, the different preparations were treated in a precisely similar manner in these respects. At first, the residue was weighed to determine the amount of albumen dissolved; but owing to the differences in the amount of water absorbed, and the difficulty in properly drying the residue, especially when partly digested, I think that the appearance of the fragments of albumen is, for practical purposes, quite as reliable.

It is very well known that many manufacturers, being aware that sundry other drugs have their uses in the treatment of dyspepsia, but forgetting that, in physiology and therapeutics, two and two do not always make four, have combined pepsin with any three or four of these drugs in the much advertised and, I fear, much used compound aromatic fragrant tonic and invigorating elixirs of pepsin, bismuth, strychnia, quinia, cod-liver oil, lacto-phosphate of lime, and Liebig's extract of beef.

Mr. Scheffer, whose experiments upon pepsin have extended much beyond the preparation of the most reliable form of this useful agent, has shown not only that the pepsin is usually precipitated by the alkalinity of the fluid used to hold the bismuth in solution, but that the bismuth itself precipitates the pepsin. The action of an elixir of bismuth, strychnia and pepsin is shown in this bottle, which may be called a visible dyspepsia, the pieces of albumen being shrunken, dark and tough, without the faintest trace of solution. I also tried a granular effervescent preparation of the same kind, with absolutely no digestion. Finally, I added the ordinary subnitrate of bismuth to a bottle containing the usual materials, with the result which you see, (no digestion.)

I think we may fairly conclude that any preparation purporting to contain both bismuth and pepsin contains *none* of the latter; and also the bismuth and pepsin in the form

of powder is not an eligible combination. If it is desired to give both they will be more efficient separately.

As regards alcohol, Mr. Scheffer stated, in one of his earlier essays, that "dry pepsin, precipitated with alcohol from its solution, did not act at all on albumen." This he afterwards found to be a mistake, since it was not from an acid solution that he obtained a precipitate by alcohol, but from one rendered neutral by carbonate of soda. The carbonate of soda permanently modifies the digestive properties of pepsin, and destroys its action on freshly-coagulated albumen. It still acts, in a different manner, upon partly digested albumen. He showed, however, and this phial shows the same thing, that alcohol does not, in small quantity, prevent the digestive process, but retards it. You notice that the amount of albumen remaining, although evidently acted upon, is much larger than that in the standard phial. It would seem, then, that a wine of pepsin may contain some of the ferment, although, from the activity of the mucous membrane, after the wine has been prepared from it, the quantity extracted cannot have been large. Another property of pepsin, which I have not before mentioned, indicates that it is to be found in rennet wine or liquid rennet. This is used for the purpose of coagulating milk, which it will do at ordinary temperatures. This coagulation is not due to its acid, as we found by comparing its action with that of dilute muriatic acid of about the same strength. If to the tube containing milk unacted upon by the acid, pepsin was added, coagulation then took place.

Also, if the rennet wine were *boiled*, it lost its action upon milk; so that, so far as its power in coagulating milk goes, rennet wine behaves like an acid solution of pepsin. The proof, however, must be in the direct experiment, the result of which you see. (A small amount of digestion. The temperature was a few degrees lower than in previous experiments, and the digestion of the albumen in pepsin, made at the same temperature for comparison, also took place slowly.)

I have tried no preparation of the wine of pepsin. There seems no reason why these should differ from the liquid rennet.

It has been thus far assumed that the conditions in these experimental phials and in the human stomach were nearly the same. It is fair, however, to state certain points of difference. In the stomach, the agitation and mixture of the solvent and food is, or ought to be, much more thorough. In the stomach, the portion digested is absorbed nearly as fast as it is formed.

In the stomach, certain incompatibles may be removed before the action of the pepsin is compelled. This is chiefly true as regards alcohol, which, in ordinary doses, is probably absorbed long before the time for the digestion of an ordinary meal is over. It is not infrequently objected that the amount of albumen dissolved by pepsin is entirely insignificant in proportion to the amount usually taken at a meal, even by and invalid. This is true, if we consider only the amount dissolved, with a given amount of acid, in these experiments, which are intended to represent only the relative value of different varieties. Mr. Scheffer has, however, shown that, under conditions resembling more closely those of stomach digestion, pepsin may be made to dissolve much more. By the successive addition of acid, water and albumen, the amount of the latter dissolved can be very much increased, so that half a grain of purified pepsin, that is, the pepsin before the addition of the sugar of milk, dissolved 1500 grains of albumen, and perhaps would have done more.

In another experiment, he found that, upon adding a saturated solution of common salt to clear fluid obtained by the digestion of albumen, a precipitate was produced which, in its turn, being dissolved in acidulated water, digested still more albumen, and, by continuing this process, twenty grains of saccharated pepsin dissolved at the rate of between 4000 and 5000 grains. That is, we see that pepsin is a true ferment, and not a chemical reagent; so that although the

amount of albumen digested in the test tube in a given time furnishes a fair test of the value of the preparation, it does not limit its activity in an organ which absorbs more or less of formed products, and which, for all we know, may be capable of rapidly returning to its own interior the ferment which, while digesting other albuminoids and giving to them in their turn catalytic power, does not lose its own activity.

Conclusions.—Much of the dissatisfaction with pepsin expressed by physicians is due to the use of preparations which contain little or none of it.

The pepsin made by Scheffer's process is by far superior to any other in ordinary use.

The wine is feeble, but not necessarily inert.

Elixirs of pepsine and bismuth are humbugs.

Pepsin should be administered with an acid, and with as few drugs as possible. A small amount of alcohol is not inadmissible, but a large amount retards digestion.

Its beneficial action is *not limited* by the amount of albumen which it dissolves in a test tube without change or renewal of any of the contents.—*Boston Med. and Surg. Journal.*

ARTICLE VII.

Preparation of Cavities.

BY C. E. FRANCIS, D. D. S., NEW YORK.

The importance of properly preparing cavities in teeth to be filled is a matter apparently too little considered by many of our fraternity, and especially is this the case with some of the younger members of the profession. Not a few operations prove failures from lack of thoroughness in this respect. Fillings become undermined with decay; the margins of cavities crumble, or walls break entirely away; fillings loosen and a destruction of crowns ensues.

Even where fillings are well impacted, with evidences of good intent on the part of the operator, at an expenditure

of much time, labor and patience, are witnessed results unfavorable and discouraging. Good, solid lumps of gold often roll about the cavities that imperfectly inclose them, like loose bullets in flasks, or hang restlessly between teeth whose openings are not sufficiently wide to permit them to escape.

It should be borne in mind that agents of destruction are constantly at work, searching out every defect in our operations, and unless they are so thoroughly performed as to effectually resist the encroachments of these insidious agents, sooner or later our efforts must prove fruitless.

In examining approximal fillings it is not uncommon to find them leaky about their cervical margins, particularly fillings between biscuspids and molars. Careful observers will notice that fillings of this class are, as a rule, less reliable than those elsewhere located. It is true that approximal fillings are more exposed to caries from the difficulty of keeping them free from extraneous substances which find lodgment about the interstices of the teeth, decomposing and generating acids; yet this should admonish us to use extra care and precaution in preparing such cavities. Unfortunately, however, they are not usually excavated as much as is needed and so invite the elements of ruin.

Cavities on the bucco-cervical and labial surface of teeth, extending to a line beyond and beneath the margin of the gum, are also liable to similar trouble.

On grinding surfaces of molars and bicuspids, the deep *sulci* between the cusps where the enamel seams are imperfectly united, are points readily invaded by caries. These fissures are not always properly treated. It will not suffice to but partly cut them out, simply forming a small opening in the center of a sulcus, or at a point of junction of two or more seams. Quoting from a distinguished dentist of the present day, "there is altogether too much of this 'botchwork,' this scratching a small hole in the middle of a defective surface, just sufficient to push in a little gold." Every such fissure indicating imperfect fusion of enamel rods, or

decalcification of structure, if left undisturbed when preparing the cavity, will present so many vulnerable points for caries to renew their attack. Numberless fillings are thus undermined and destroyed.

It is not always due to an inherent carelessness on the part of the dentist, nor from lack of interest or indifference to duty, that cavities are imperfectly excavated; yet such charges may sometimes be justly preferred; but rather from inability to clearly see and define the exact condition of things.

The secretions from the salivary glands; the exudations from minute follicles that border the necks of the teeth; the flow of blood from the gum when wounded by the instrument; the *debris*, chips, etc., started by the excavator, all tend to fill the cavity and conceal its real condition. How frequently it occurs that after a cavity is supposed to be ready for the filling—having been treated to a good washing and the moisture entirely absorbed—we are surprised to discover that it is not entirely free from caries matter, and more excavating is required.

The truth is, too many of us work in the dark, depending more upon the sense of feeling than of vision; getting but occasional glimpses of some of the cavities we are endeavoring to excavate, just after washing them and mopping out the moisture. Could we but keep the cavities dry, much time and trouble might be saved, and the excavating be more thoroughly done with less pain to the patient; for it is a well-established fact that the dentine is less sensitive to the touch of the instrument when kept free from moisture. After the contents of the cavity are syringed out with warm water and the bulk of decay removed, it is well to apply the rubber dam. Then with a blow-pipe charged with warm air, the cavity may be kept free from chips and dust. Taking all things into consideration, it is no loss of time to make use of the sheet rubber when preparing such cavities as are difficult to keep dry.

The margins of all cavities should be made as smooth as possible. In many cases it is advisable to polish them with

sticks of superior stone, also to polish the cavities of incisors with powdered pumice-stone.

For trimming cervical walls, the spoon-shaped excavators are safest and best. These instruments, of various sizes and bent at different angles, do excellent execution, and no operator should be without them. For the approximal margins, in connection with chisels, the sickel-shaped instruments, designed by Dr. Lord, are of great value. To dentists who are accustomed to their use, these instruments are indispensable. The deep fissures on molars and bicuspids are good cases for burring-engines.

If every dentist would take the care and precaution that his operations really require, comparatively few failures would occur; and in no part of our operations do we need to exercise greater precaution than in preparing cavities for filling, if we desire work that will be enduring and satisfactory to both patient and operator.—*Penn. Journal of Dental Science.*

ARTICLE VIII.

On Saponin as a Local Anæsthetic.

The *London Medical Record* quotes from Dr. Kohler on this subject:—

Saponin is obtained from many plants of natural orders. Silenæ (*e.g.* Saponaria of ficinalis) the Polygalaceæ (*e.g.* Polygala senega) of the Spireæ (Rosaceæ) (*e.g.* Quillaja saponaria) and the Sapotaceæ (Cortex monesiæ); it is an amorphous white powder, with neutral reaction and sweetish taste; it is soluble in water, forming a foaming fluid like soap-suds. The experiments made on it proved its local effects as well as those on the muscles and nervs of the extremities by subcutaneous injections, on the exposed hearts of frogs, on the intestines, and on the nervous centres by direct application to these organs; then the general effects from injections into the jugular veins; and lastly, the symptems produced by its introduction into the stomach.

The most important local effects are as follows. Five minutes after the application of a few drops of a concentrated solution, there occur perfect suspension of the reflex irritability of the part selected, and paralyses of both motor and sensory nerve-filaments

Shortly afterwards, the muscles of the part lose their power responding to chemical, mechanical, or electric irritants; and this may occur somewhat independently of the nerves. The nerve-trunks, and afterwards the nervous centres, do not become effected till larger quantites of the solution are applied, and then probably by absorption, as the effects become general. The capillaries, at the spot selected for injection, become greatly contracted, and so do the larger vessels, such as the vena cava and aorta, when the saponin is applied directly to them. When it is applied directly to the heart, the beats of this organ gradually become less frequent, and then cease altogether. This effect does not depend upon irritation of the terminal branches of the vagi, but on paralysis of the accelerator nerves (sympathetic), which thus raises the 'tonus' of the vagus filaments. Finally paralysis of the cardiac ganglia themselves (*i.e.* of those imbedded in the muscles of the heart) ensues. In a like manner, direct application of the solution to the abdominal organs first paralyzes their muscles and then their nerves. Local application to the nervous centres induces, at last, complete paralysis of these organs. This spreads peripheraly from the spinal cord; and, continuing to affect the medulla oblongata and the cerebrum, produces asphyxia (stoppage of respiration), deep coma, and dilatation of the pupils. The series of experiments made by injecting saponin into the vena cava of warm-blooded animals produced these effects; diminution of blood-pressure, succeeding a slight temporary increase of it; reduction of temperature and of the frequency of both respirations and cardiac contractions. The effects on respiration and upon blood pressure are produced through the nervous centre for these functions. The spsnal cord and the peripheral muscles and nerves are not

paralyzed by these injections into the veins. Lastly, when saponin is introduced into the stomach, blood pressure is reduced, and pulse, respiration and temperature all sink, through slowly; paralyses of the extremities (as in the injections into the veins also) does not occur in this case. No alteration in either the quaniitiy or quality of the excreta have been observed. Clinical practice only can decide weather saponin may play a great part in surgery as a local anæsthetic.—*Med. and Surg. Reporter.*

ARTICLE IX.

Case of Excision of the left Superior Maxillary and Malar Bones, and one-half of the Nose.

BY M. METIVIER, HOLYOKE, MASS.

A few weeks since, Dr. Metivier operated on a woman suffering a large cancerous tumour, which involved the left cheek, and left side of the nose, together with the Superior Maxillary and Malar bones, on the same side. As a large portion of the integument and tissues below the eye had been removed by ulceration, and a large gap was left, it was not possible to make a flap in the usual way; the following plan was therefore adopted. The patient was seateR in a chair, and put slightly under the influence of chloroform, the head leaning well forward, to prevent the blood from running into the throat. An incision was then made, beginning on the middle of the nose, at the nasal process of the superior Maxillary bone, and was carried downwards, dividing the nose at the edge of the septum, and opening up the nostril. It was then carried down, dividing the upper lip in the middle line, into the mouth. A second incision was made from the zygoma, horizontal to the superior border of the Malar bone, and on the margin of the orbital plate. This incision curved upwards. A third incision was then made, beginning at the external angular process of the frontal bone, and running obliquely downwards to the lower margin of the nostril, connecting with the first incision,

and leaving a large triangular portion of integument to be excised with the tumour. Several arteries required to be tied at this stage of the operation. The soft parts of the hard palate were then divided, and a tooth drawn; the alveolar process was sawed through, and the palatine and orbital plates divided with the bone pliers. The saw was again used to divide the Malar bone, and the Zygomatic process. A few sweeps of the knife, with strong depression, brought down the mass out of its place, leaving a large hole. The patient was roused from under the influence of chloroform several times during the operation, in order that she might clear the throat from clots of blood, and also that she might take a stimulant. The bleeding was slight, not amounting to more than three ounces. In order to replace the lost integuments which had been excised with the tumour, the incision on the zygoma and the dissection of the integuments was extended almost to the ear. The flap was stretched and attached to the root of the nose by interrupted sutures. It was cut of the proper shade to adopt itself to form the lost half of the nose, and then was attached to the whole length of the side of the nose, and also the lip. It was also fixed to the lower eyelid by several sutures. The cheek was filled up with a large piece of linen soaked in carbolic acid and oil, and carbolic acid water dressing was applied externally to the whole wound. The patient walked to bed after the operation, saying that she was not weak, and did not suffer any pain. In one month's time the wound had healed, leaving scarcely any disfigurement, much to the satisfaction of the patient, who could not be persuaded that the disease would certainly recur.—*Canada Med. and Surg. Journal.*

EDITORIAL, ETC.

Dentistry.—From an article published in the *British Journal of Dental Science*, under the title of "The Saturday Review on Dentistry," we take the following:

"To any one who is anxious to prove 'material civilization' a mistake, the inquiry may be suggested, What effect has the invention of knives and forks had upon the teeth of those nations who have condescended to adopt the use of them? For these pernicious utensils plainly render good teeth less a necessary of life than they were before, so that people with bad teeth now survive, transmit their degenerate natural weapons to their descendants, and so on. And, therefore, to Mr. Galton and others, who are anxious to guard the interests of the future by promoting marriage on scientific principles, we may suggest the propriety of including sound teeth in the list of excellences required of those about to marry. The priest or registrar might call upon the parties to a proposed marriage to produce, among other certificates, one showing that they themselves had sound teeth, and likewise their fathers and mothers, their grandfathers and grandmothers, and such other relatives as the *savants* may think a sufficient guarantee against reversion. Or perhaps these matters are to be left to the young people themselves, and a man's asking a girl if she has ever suffered from toothache may one day be a recognized way of hinting that he is coming to the point.

But if such means of securing the peace of posterity fail, others may be devised. Amidst the press of unexpected ideas, projects and events, it is daily becoming more difficult to detect an absurdity at first sight; and so the following ingenious speculation which has been started may yet be realized. What if hereafter every one on arriving at a certain age should be bound to yield up the natural teeth, and receive in exchange an artificial set warranted not to ache, and which might be renewed from

time to time in case of their ceasing to fit, being swallowed, stolen by garrotters, or other accidents which already are not unexampled? It would demand some courage perhaps once in a lifetime, but that must be better than once a year as at present? Besides, are there not anæsthetics? And, moreover, stern laws, backed by a public opinion instructed in what truly makes for social welfare, would as in Sparta deter the youth from showing the white feather, and they would sit down smiling; just as some American Indians with whom beards are unfashionable, on reaching the age when rudiments of beards appear, submit, it is said, to have them plucked out hair after hair by squaws, and account it a virtue not to groan or wince, though they are the old squaws who do it. By thus losing all our teeth at once as a matter of course, we should no longer be haunted by the regretful feelings which now disturb us, as wandering about the world, visiting many cities, and perhaps many dentists, we drop them as pledges of mortality, one here and another there, and already long before death reflect that our bones lies scattered on every shore. And this will be a relief to many persons; for how imagination follows those fragments of our being, whoever is familiar with folklore knows well.

We have said, perhaps somewhat hastily, that dentists are our own flesh and blood; but at any rate this acknowledgment does not extend to those dentists who put horrible signs of their profession outside their houses in the public streets. What we refer to is too hideous to describe with decency, but every one must understand us. Such things can only be in place in a scientific museum. The only device to be compared to this one is the pirate's flag with its skull and cross-bones, but the flag is much the less revolting of the two. We should have thought such a mode of advertising would have been considered unprofessional, and we are sure it cannot be attractive."

Dentistry by the Hour.—The *Boston Cammercial Bulletin* comments as follows upon the practice of regulating dental fees by time consumed:

"Our fashionable and 'high-toned' dentists have made a new departure in the conduct of their business. Instead of taking a man's mouth by contract, and charging a lump price for the

torture they have inflicted upon him, it is now proposed to do "hour work" exclusively, the price being fixed at five dollars for every sixty minutes' work with forceps and files, to say nothing of those soothing scrapers, with which these gentry delight to fondle a tender tooth. There will be no hurry now, and the patient may rest assured that although 'time is money,' it is, in this instance, his money, to gain which the artist will linger lovingly over each gaping cavity, and by the aid of a delicate steel hook, dally with a tender nerve to while the time away. There is some relief when the washerwoman's boy drops in to bring a fresh supply of napkins, wherewith to smother the profanity that is but too apt to come to the surface in a dentist's chair, especially if the dentist, never dealing in small sums, has nothing smaller than an X with him, and is compelled to visit a neighbor for the change; but even the comfort which this respite brings loses its charms when the victim reflects that these minutes—precious indeed—are just as costly as though the dentist were subjecting him to the most ingenious and exquisite torture."

Reaching Pulp Canals.—At a late meeting of the New York Odontological Society, the proceedings of which are published in the *Dental Miscellany*, Dr. Edward Maynard, in answer to a question "how the pulp canal of an inferior molar could best be reached when the cavity of decay was in the posterior approximal surface," advised "filling the cavity of decay as a simple cavity, and then drilling through the grinding surface, or downward and inward through the buccal surface, commencing near the grinding surface, into the pulp cavity, thus sacrificing but a small amount of tooth substance, and not lessening in any degree the strength of the crown."

"Dr. Maynard illustrated his method by diagrams on the black-board.

He related a case in which, several years ago, he had amputated and extracted the posterior half of the crown, and the posterior root of an inferior molar, shaping the crown remaining as a bicuspid—the removed portion of the crown being much decayed, and the extracted root having a persistent abscess. The result was a perfect success, the tooth doing good service for many years.

Also a case of amputating a portion of the root of an inferior incisor, which protruded through the gum. The gum healed over nicely, and three years after the case was doing well. He performed the operation by drilling a small hole *through* the root at the proposed line of amputation ; enlarged it ; then with a hoe-shaped instrumeut cut through the remaining portion at each side of the hole, drawing the shaving of root outwards at each cut."

Salivation Produced by Mixing Amalgams in the Hands.—An English dentist relates the case of his son who complained of tenderness in his gums, "increasing after an amalgam operation," together with the characteristic metallic taste in the mouth. The operator must be in the habit of using a large quantity of amalgam in his practice to produce such a result, or be almost as susceptible to the influence of mercury as the person in the case related by Dr. Watson in his Practice of Medicine, "that when his wife had rubbed a very small quantity of white precipitate ointment upon her neck, for some cutaneous affection, his gums were tender for three or four days after sleeping with her, and slight salivation took place. This did not happen once only, but three several times."

BIBLIOGRAPHICAL.

A Dictionary of Medical Science, containing a concise explanation of the various subjects and terms of Anatomy, Physiology, Pathology, Hygiene, Therapeutics, Medical Chemistry, Pharmacology, Pharmacy, Surgery, Obstetrics, Medical Jurisprudence, and Dentistry. Notices of climate and mineral waters, formulæ for officinal, empirical and dietetic preparations ; with the accentuation and etymology of the terms, and the French and

othor synonyms. By Robley Dunglison, M. D., L. L. D. A new edition enlarged and thoroughly revised by Richard J. Dunglison, M. D. Published by Henry C. Lea, Philadelphia, 1874.

The new edition of this old and reliable text book will meet with a cordial welcome, as no less than six thousand terms and subjects have been added, and the type so enlarged as to greatly enhance the value of the work, and bring it up to the requirements of the day. The typographical arrangement of this new edition renders reference much more easy, and the care devoted to the accentuation as well as derivation of terms makes it a complete pronouncing dictionary.

Transactions of the American Dental Association, at the Thirteenth Annual Meeting, held at Put-in-Bay, August, 1873. Chicago, Knight & Leonard, Printers.

The Publication Committee, consisting of Drs. M. S. Dean, G. H. Cushing and H. A. Smith, can congratulate themselves on having presented a volume superior in every respect to those which have preceded it; indeed it is the best ever issued by any Association.

The Histological illustrations accompanying the report on Histology, by Dr. T. B. Hitchcock, render this volume of great value, and well worthy of perusal. Copies of these proceedings for the year 1873, can be had from the Publication Committee, 550 Michigan Avenue, Chicago. Price on tinted paper, with Histological illustrations, in muslin covers, $2.00 ; on white paper, without illustrations, in paper covers, $1.00.

MONTHLY SUMMARY.

The Siamese Twins.—These xiphopage monsters, Chang and Eng Bunker, were born in Siam, in 1811, and lived for many years on their plantation in North Carolina, where they died January 17. Chang suffered from lung disease, but the immediate cause of his death is supposed to have been cerebral blood-clot, and Eng is thought to have died, about two hours later, from fright.

At a meeting of the College of Physicians of Philadelphia, held on the 18th of February, Drs. Wm. H. Pancoast and Harrison Allen, the committee of the College entrusted with the post-mortem examination of the twins, presented a preliminary report of their dissection, which was in brief to the following effect:—

The twins were found to be united at the ensiform cartilage by a band about four inches long, and eight inches in circumference. Upon exploring this band through the abdominal cavity, it was found that in Eng the peritoneal cavity extended by a pouch into the band, and terminated there, a short distance beyond the median line; and in Chang two peritoneal prolongations or pouches were found, also extending into the band beyond the median line, and overlapping, one above and the other below the single peritoneal pouch of Eng.

In regard to the vascular connection it was found that on throwing coloured plaster injection into the portal circulation of Chang it flowed through the vessels of the upper part of the band into the portal vessels of Eng. The hypogastic arteries were found to run upward in each body into the band, and were lost in their way toward the common umbilicus in the anterior inferior surface of the middle of the band. Subsequently it was found that the two livers, which were supposed to be joined only by bloodvessels, were really one body, the parenchymatous tissue being continuous between them, so that when they were removed from the bodies and placed on the table they formed one mass. The so-called tract of portal continuity is, therefore, liver-tissue. Chang was supposed to be possessed of one more pouch than Eng. When the liver was removed, however, an upper hepatic pouch was found also proceeding from Eng, so that the band contained four pouches of peritoneum, besides liver-tissue.—*Med. News and Library.*

Needle Swallowed by a Child—Removed Six Months afterwards from the Thigh.—By B. Schermerhorn, M. D., of Buskirk's Bridge, N. Y.—Emma S., a child of fourteen months, was brought to me June 18, 1873, by its parents, who gave the following history. About six months ago the child swallowed an ordinary sewing needle which lodged in the throat, and was pushed downward with a swab in the hands of its Grandmother. From that time until about a month since it gave the child no trouble; since then it has been more or less worrisome and fretful, and during the last night before being brought to me it cried the whole time. Upon dressing the little one in the morning the mother's attention was drawn to a little elevation of the skin, like a pimple, upon the outer aspect of the left thigh, midway between the knee aud hip-joint. Thinking of the needle they

came with the child to my office, and after laying open the cuticle I removed a needle an inch and a quarter in length, which lay with its eye to the surface.—*Med. News and Library.*

A New Way of Gargling.—At a recent meeting of the Clinical Society of London, Dr. Guinier showed, means of the laryngoscope, that it was practicable to allow any fluid to pass beyond the epiglottis, and to remain between that organ and the vocal cords during the time occupied by a long expiration. or as long as the patient can " hold his breath." Dr. Guinier used water in his demonstration : the vocal cords were plainly seen through the fluid, and the operator also ejected the latter through the nose. Although the sensibility of the soft palate and parts adjacent is known to be, comparatively speaking, inconsiderable, a general impression appeared to exist among the members that much practice would be required on the part of the patient to bring about so successful a result as that achieved in his case by Dr. Guinier. The following rules must be observed and practiced in the operation : (1) Raise the head slightly, (2) open the mouth to a moderate extent, (3) advance the chin and lower the jaw, (4) sound, or make an intention of sounding the double vowel œ. The author remarks that, as a consequence of these four movements carried on simultaneously, the pharynx is widened, the soft palate and uvula are raised, the base of the tongue is depressed, and the liquid thus flows by virture of its own weight into the laryngeal cavity.—*Med. and Surg. Reporter.*

A new Operation for Cleft Palate.—On the 22d of November, Sir William Fergusson, in operating on two patients for the closure of the opening in the hard palate after the cleft in the soft palate had been closed, adopted a modification of a procedure which is intended to increase the chances of success of the operation. Sir William remarked that in the so-called Langenbeck operation—that is, where muco-periosteal flaps are taken from the roof of the mouth and drawn towards the middle line —the proceeding is often unsuccessful from the fact that, after some time, the granulations which are thrown out on the upper surfaces of the displaced flaps contract and separate the union that may have taken place between the pared edges of the flaps. It is true, he observed, that some assert that bony matter is deposited on the upper surface, and that this diminishes the size of the aperture in the osseous palate. But, in demurring to this, Sir William said he thought it was hardly possible to strip off healthy periosteum from the subjacent bone. He proposed, therefore, as a remedy, that in addition to making the ordinary incision for the flaps, the hard palate should be split on each

side of the opening with some sharp cutting instrument, and that the two pieces of bone should be pressed towards the middle line, and the pared edges of the soft tissues then be brought together. By this means the central opening would be closed, but two lateral apertures would be formed. But inasmuch as the lateral openings would be but half the size of the original central one, and as there would be more likelihood of the fractured edges of bone throwing out osseous material for its repair, it was hoped that the prospect of a successful issue would be greatly enhanced.

It remains to be seen what will be the result of this ingenious device, but on the first blush it appears that by its adoption a means is offered of surmounting one of the most obstinate difficulties of plastic surgery.—*Lancet.*

New Source of India Rubber.—Although it has long been known that the milky juice of the common silk-weed, *Asclepias Cornuti*, contains a proportion of caoutchouc, and though thirty years ago Schultz announced this constituent to exist in notable quantity, yet, until lately, we were not aware of any practical advantage having been taken of the fact. We understand, however, that, a short time ago, this subject attracted the attention of some gentlemen residing in the Western portion of this province, and that, on the strength of preliminary experiments, a company, having an authorized capital of $100,000, was formed at London, Ont., for the purpose of carrying out this new and promising branch of manufacture.

So far the undertaking has not passed the experimental stage, as the company are desirous of ascertaining the best methods of manufacture, and the probable extent of the business, before encroaching largely upon their capital. At the outset, a call of five per cent. was made, and the result of the experiments made was so encouraging as to warrant a further call of five per cent. for the purpose of continuing these experiments on a more extensive and practical scale.

In a late experiment, one thousand pounds of milk-weed were operated upon, and this quantity was said to yield about four per cent. of caoutchouc. The process consisted in subjecting the plant to partial decomposition, heating by steam, and then treating with coal-tar naptha. The benzine, holding the caoutchouc in solution, was then distilled, when the rubber was finally obtained in a solid form. Of the benzine, about eighty per cent. was recovered.

The rubber so obtained possesses all the ordinary characteristics of pure caoutchouc, and in its solubilities is identical with that substance. The company have, of course, protected their

manufacture by patents; and we understand that in the United States, if not in Canada, patents for applying the process of vulcanization have also been obtained. The original patent does not apply exclusively to milk-weed, but is extended to other caoutchouc-bearing plants, as the bamboo-berry, flaxseed, etc.

A curious fact is stated in regard to the benzine recovered by distillation from the plant mentioned While, in its original condition, benzine is exceedingly inflammable and explosive, it is said that it loses the latter property after distillation, and, in regard to the former, is so modified as to be easily manageable; so much so, that the company intend offering it for sale as a new burning fluid. Perhaps some of our readers can account for this change of properties.—*Canadian Pharm. Journal.*

Ergot in Epistaxis.—Dr. Andrew H. Smith (*The Medical Record*, October 15, 1873) reports the case of a man, æt. 37, who suffered from persistent epistaxis, recurring sometimes two or three times a day. Direct and rhinoscopic examinations showed no abnormal condition of the nasal mucous membrane. Astringents were applied locally by means of both the brush and syinrge, and such general treatment was resorted to as the symptoms demanded. After this had been persevered in for two weeks without affecting the hemorrhages, the fluid extract of ergot was prescribed in twenty-drop doses three times a day.

This was continued for ten days, with the effect of entirely restraining the bleeding from the time the first dose was taken. The medicine was then omitted, but in a few days the bleeding began anew. It was immediately arrested by a resort to the drug, and did not afterwards return; the medicine being continued at gradually increasing intervals for nearly a month.

Cure for Baldness.—An English paper relates the following case:—

A gentleman, who had lost nearly all his hair after a very severe attack of fever, consulted a French physician of great reputed success as a hair-restorer. The prescription was a drachm of the homœopathic tincture of phosphorous to one ounce of castor oil; the bare spot to be rubbed with this mixture three times weekly for half an hour each time, after the skin of the head had been thoroughly cleansed with warm water without soap. This treatment was faithfully carried out for about six months; the hair soon began to grow, and in a year from the time of first following the doctor's advice, his head was as thoroughly covered as ever, the new crop of hair being about two shades darker than the old.—*Druggists' Circular.*

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